

SEQUENCE LISTING

<110> Hugh Allen Oliver Hill et al.

<120> HYDROGEN PEROXIDE OXIDATION

<130> H0-P03373US0

<160> 36

<170> PatentIn version 3.2

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<211> 1248

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<221> CDS

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cgtagatttc atctatttag tgactttag cggttgattg gagggcaagg tgaagactcc 4840

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Trp Lys Lys Ala His Asn Ile Leu Leu Pro Ser Phe Ser Gln Gln Ala
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Met Lys Gly Tyr His Ala Met Met Val Asp Ile Ala Val Gln Leu Val
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Gln Lys Trp Glu Arg Leu Asn Ala Asp Glu His Ile Glu Val Pro Glu
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Asp Met Thr Arg Leu Thr Leu Asp Thr Ile Gly Leu Cys Gly Phe Asn
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Tyr Arg Phe Asn Ser Phe Tyr Arg Asp Gln Pro His Pro Phe Ile Thr
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Ser Met Val Arg Ala Leu Asp Glu Ala Met Asn Lys Leu Gln Arg Ala
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Asn Pro Asp Asp Pro Ala Tyr Asp Glu Asn Lys Arg Gln Phe Gln Glu
 195 200 205

Asp Ile Lys Val Met Asn Asp Leu Val Asp Lys Ile Ile Ala Asp Arg
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Lys Ala Ser Gly Glu Gln Ser Asp Asp Leu Leu Thr His Met Leu Asn
 225 230 235 240

Gly Lys Asp Pro Glu Thr Gly Glu Pro Leu Asp Asp Glu Asn Ile Arg
 245 250 255

Tyr Gln Ile Ile Thr Phe Leu Ile Ala Gly His Glu Thr Thr Ser Gly
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 Leu Leu Ser Phe Ala Leu Tyr Phe Leu Val Lys Asn Pro His Val Leu
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 Gln Lys Ala Ala Glu Glu Ala Ala Arg Val Leu Val Asp Pro Val Pro
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 Ser Tyr Lys Gln Val Lys Gln Leu Lys Tyr Val Gly Met Val Leu Asn
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 Glu Ala Leu Arg Leu Trp Pro Thr Ala Pro Ala Phe Ser Leu Tyr Ala
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 Lys Glu Asp Thr Val Leu Gly Gly Glu Tyr Pro Leu Glu Lys Gly Asp
 340 345 350
 Glu Leu Met Val Leu Ile Pro Gln Leu His Arg Asp Lys Thr Ile Trp
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 Gly Asp Asp Val Glu Glu Phe Arg Pro Glu Arg Phe Glu Asn Pro Ser
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 Cys Ile Gly Gln Gln Phe Ala Leu His Glu Ala Thr Leu Val Leu Gly
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 Met Met Leu Lys His Phe Asp Phe Glu Asp His Thr Asn Tyr Glu Leu
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 Ala Lys Ser Lys Lys Ile Pro Leu Gly Gly Ile Pro Ser Pro Ser Thr
 450 455 460
 Glu Gln Ser Ala Lys Lys Val Arg Lys Lys Ala Glu Asn Ala His Asn
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 485 490 495
 Thr Ala Arg Asp Leu Ala Asp Ile Ala Met Ser Lys Gly Phe Ala Pro
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 Gln Val Ala Thr Leu Asp Ser His Ala Gly Asn Leu Pro Arg Glu Gly
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 Asp Phe Glu Gly Thr Tyr Glu Glu Trp Arg Glu His Met Trp Ser Asp
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 Ser Thr Leu Ser Leu Gln Phe Val Asp Ser Ala Ala Asp Met Pro Leu
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Ala Lys Met His Gly Ala Phe Ser Thr Asn Val Val Ala Ser Lys Glu
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 675 680 685
 Leu Pro Lys Glu Ala Ser Tyr Gln Glu Gly Asp His Leu Gly Val Ile
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 Tyr Val Glu Leu Gln Asp Pro Val Thr Arg Thr Gln Leu Arg Ala Met
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 Ala Ala Lys Thr Val Cys Pro Pro His Lys Val Glu Leu Glu Ala Leu
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 Met Leu Glu Leu Leu Glu Lys Tyr Pro Ala Cys Glu Met Lys Phe Ser
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 Glu Phe Ile Ala Leu Leu Pro Ser Ile Arg Pro Arg Tyr Tyr Ser Ile
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 Ser Ser Ser Pro Arg Val Asp Glu Lys Gln Ala Ser Ile Thr Val Ser
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 Val Val Ser Gly Glu Ala Trp Ser Gly Tyr Gly Glu Tyr Lys Gly Ile
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 Thr Pro Leu Ile Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Arg
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 Gly Phe Val Gln Ala Arg Lys Gln Leu Lys Glu Gln Gly Gln Ser Leu
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 Gly Glu Ala His Leu Tyr Phe Gly Cys Arg Ser Pro His Glu Asp Tyr
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 965 970 975
 Gln His Val Met Glu Gln Asp Gly Lys Lys Leu Ile Glu Leu Leu Asp
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 Gln Gly Ala His Phe Tyr Ile Cys Gly Asp Gly Ser Gln Met Ala Pro
 995 1000 1005
 Ala Val Glu Ala Thr Leu Met Lys Ser Tyr Ala Asp Val His Gln
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 Leu Pro Leu Leu Asn Thr Asp Lys Pro Val Gln Ala Leu Met Lys Ile
 20 25 30
 gcg gat gaa tta gga gaa atc ttt aaa ttc gag gcg cct ggt cgt gta 144
 Ala Asp Glu Leu Gly Glu Ile Phe Lys Phe Glu Ala Pro Gly Arg Val
 35 40 45
 acg cgc tac tta tca agt cag cgt cta att aaa gaa gca tgc gat gaa 192
 Thr Arg Tyr Leu Ser Ser Gln Arg Leu Ile Lys Glu Ala Cys Asp Glu
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 tca cgc ttt gat aaa aac tta agt caa gcg ctt aaa ttt gta cgt gat 240
 Ser Arg Phe Asp Lys Asn Leu Ser Gln Ala Leu Lys Phe Val Arg Asp
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 Phe Ala Gly Asp Gly Leu Ala Thr Ser Trp Thr His Glu Lys Asn Trp
 85 90 95
 aaa aaa gcg cat aat atc tta ctt cca agc ttc agt cag cag gca atg 336
 Lys Lys Ala His Asn Ile Leu Leu Pro Ser Phe Ser Gln Gln Ala Met
 100 105 110
 aaa ggc tat cat gcg atg atg gtc gat atc gcc gtg cag ctt gtt caa 384
 Lys Gly Tyr His Ala Met Met Val Asp Ile Ala Val Gln Leu Val Gln
 115 120 125
 aag tgg gag cgt cta aat gca gat gag cat att gaa gta ccg gaa gac 432
 Lys Trp Glu Arg Leu Asn Ala Asp Glu His Ile Glu Val Pro Glu Asp
 130 135 140
 atg aca cgt tta acg ctt gat aca att ggt ctt tgc ggc ttt aac tat 480
 Met Thr Arg Leu Thr Leu Asp Thr Ile Gly Leu Cys Gly Phe Asn Tyr
 145 150 155 160
 cgc ttt aac agc ttt tac cga gat cag cct cat cca ttt att aca agt 528
 Arg Phe Asn Ser Phe Tyr Arg Asp Gln Pro His Pro Phe Ile Thr Ser
 165 170 175
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 Met Val Arg Ala Leu Asp Glu Ala Met Asn Lys Leu Gln Arg Ala Asn
 180 185 190
 cca gac gac cca gct tat gat gaa aac aag cgc cag ttt caa gaa gat 624
 Pro Asp Asp Pro Ala Tyr Asp Glu Asn Lys Arg Gln Phe Gln Glu Asp
 195 200 205
 atc aag gtg atg aac gac cta gta gat aaa att att gca gat cgc aaa 672
 Ile Lys Val Met Asn Asp Leu Val Asp Lys Ile Ile Ala Asp Arg Lys
 210 215 220
 gca agc ggt gaa caa agc gat gat tta tta acg cat atg cta aac gga 720
 Ala Ser Gly Glu Gln Ser Asp Asp Leu Leu Thr His Met Leu Asn Gly
 225 230 235 240
 aaa gat cca gaa acg ggt gag ccg ctt gat gac gag aac att cgc tat 768

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				245					250					255		
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Gln	Ile	Ile	Thr	Phe	Leu	Ile	Ala	Gly	His	Glu	Thr	Thr	Ser	Gly	Leu	
			260					265					270			
tta	tca	ttt	gcg	ctg	tat	ttc	tta	gtg	aaa	aat	cca	cat	gta	tta	caa	864
Leu	Ser	Phe	Ala	Leu	Tyr	Phe	Leu	Val	Lys	Asn	Pro	His	Val	Leu	Gln	
		275					280					285				
aaa	gca	gca	gaa	gaa	gca	gca	cga	ggt	cta	gta	gat	cct	ggt	cca	agc	912
Lys	Ala	Ala	Glu	Glu	Ala	Ala	Arg	Val	Leu	Val	Asp	Pro	Val	Pro	Ser	
	290					295					300					
tac	aaa	caa	gtc	aaa	cag	ctt	aaa	tat	gtc	ggc	atg	gtc	tta	aac	gaa	960
Tyr	Lys	Gln	Val	Lys	Gln	Leu	Lys	Tyr	Val	Gly	Met	Val	Leu	Asn	Glu	
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Ala	Leu	Arg	Leu	Trp	Pro	Thr	Ala	Pro	Ala	Phe	Ser	Leu	Tyr	Ala	Lys	
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gaa	gat	acg	gtg	ctt	gga	gga	gaa	tat	cct	tta	gaa	aaa	ggc	gac	gaa	1056
Glu	Asp	Thr	Val	Leu	Gly	Gly	Glu	Tyr	Pro	Leu	Glu	Lys	Gly	Asp	Glu	
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cta	atg	gtt	ctg	att	cct	cag	ctt	cac	cgt	gat	aaa	aca	att	tgg	gga	1104
Leu	Met	Val	Leu	Ile	Pro	Gln	Leu	His	Arg	Asp	Lys	Thr	Ile	Trp	Gly	
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gac	gat	gtg	gaa	gag	ttc	cgt	cca	gag	cgt	ttt	gaa	aat	cca	agt	gcg	1152
Asp	Asp	Val	Glu	Glu	Phe	Arg	Pro	Glu	Arg	Phe	Glu	Asn	Pro	Ser	Ala	
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Ile	Pro	Gln	His	Ala	Phe	Lys	Pro	Phe	Gly	Asn	Gly	Gln	Arg	Ala	Cys	
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Ile	Gly	Gln	Gln	Phe	Ala	Leu	His	Glu	Ala	Thr	Leu	Val	Leu	Gly	Met	
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atg	cta	aaa	cac	ttt	gac	ttt	gaa	gat	cat	aca	aac	tac	gag	ctg	gat	1296
Met	Leu	Lys	His	Phe	Asp	Phe	Glu	Asp	His	Thr	Asn	Tyr	Glu	Leu	Asp	
			420					425					430			
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Ile	Lys	Glu	Thr	Leu	Thr	Leu	Lys	Pro	Glu	Gly	Phe	Val	Val	Lys	Ala	
		435					440					445				
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Lys	Ser	Lys	Lys	Ile	Pro	Leu	Gly	Gly	Ile	Pro	Ser	Pro	Ser	Thr	Glu	
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cag	tct	gct	aaa	aaa	gta	cgc	aaa	aag	gca	gaa	aac	gct	cat	aat	acg	1440
Gln	Ser	Ala	Lys	Lys	Val	Arg	Lys	Lys	Ala	Glu	Asn	Ala	His	Asn	Thr	
465					470				475					480		
ccg	ctg	ctt	gtg	cta	tac	ggt	tca	aat	atg	gga	aca	gct	gaa	gga	acg	1488
Pro	Leu	Leu	Val	Leu	Tyr	Gly	Ser	Asn	Met	Gly	Thr	Ala	Glu	Gly	Thr	
				485					490					495		
gcg	cgt	gat	tta	gca	gat	att	gca	atg	agc	aaa	gga	ttt	gca	ccg	cag	1536
Ala	Arg	Asp	Leu	Ala	Asp	Ile	Ala	Met	Ser	Lys	Gly	Phe	Ala	Pro	Gln	
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gtc	gca	acg	ctt	gat	tca	cac	gcc	gga	aat	ctt	ccg	cgc	gaa	gga	gct	1584
Val	Ala	Thr	Leu	Asp	Ser	His	Ala	Gly	Asn	Leu	Pro	Arg	Glu	Gly	Ala	
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Val	Leu	Ile	Val	Thr	Ala	Ser	Tyr	Asn	Gly	His	Pro	Pro	Asp	Asn	Ala	
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Gly Val Arg Tyr Ser Val Phe Gly Cys Gly Asp Lys Asn Trp Ala Thr	
565 570 575	
acg tat caa aaa gtg cct gct ttt atc gat gaa acg ctt gcc gct aaa	1776
Thr Tyr Gln Lys Val Pro Ala Phe Ile Asp Glu Thr Leu Ala Ala Lys	
580 585 590	
ggg gca gaa aac atc gct gac cgc ggt gaa gca gat gca agc gac gac	1824
Gly Ala Glu Asn Ile Ala Asp Arg Gly Glu Ala Asp Ala Ser Asp Asp	
595 600 605	
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Phe Glu Gly Thr Tyr Glu Glu Trp Arg Glu His Met Trp Ser Asp Val	
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Ala Ala Tyr Phe Asn Leu Asp Ile Glu Asn Ser Glu Asp Asn Lys Ser	
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act ctt tca ctt caa ttt gtc gac agc gcc gcg gat atg ccg ctt gcg	1968
Thr Leu Ser Leu Gln Phe Val Asp Ser Ala Ala Asp Met Pro Leu Ala	
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Lys Met His Gly Ala Phe Ser Thr Asn Val Val Ala Ser Lys Glu Leu	
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Gln Gln Pro Gly Ser Ala Arg Ser Thr Arg His Leu Glu Ile Glu Leu	
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Pro Lys Glu Ala Ser Tyr Gln Glu Gly Asp His Leu Gly Val Ile Pro	
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Arg Asn Tyr Glu Gly Ile Val Asn Arg Val Thr Ala Arg Phe Gly Leu	
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Val Glu Leu Gln Asp Pro Val Thr Arg Thr Gln Leu Arg Ala Met Ala	
755 760 765	
gct aaa acg gtc tgc ccg ccg cat aaa gta gag ctt gaa gcc ttg ctt	2352
Ala Lys Thr Val Cys Pro Pro His Lys Val Glu Leu Glu Ala Leu Leu	
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785 790 795 800	
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Leu Glu Leu Leu Glu Lys Tyr Pro Ala Cys Glu Met Lys Phe Ser Glu	
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Phe Ile Ala Leu Leu Pro Ser Ile Arg Pro Arg Tyr Tyr Ser Ile Ser	
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Ser Ser Pro Arg Val Asp Glu Lys Gln Ala Ser Ile Thr Val Ser Val	
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Ile Ser Thr Pro Gln Ser Glu Phe Thr Leu Pro Lys Asp Pro Glu Thr
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Pro Leu Ile Met Val Gly Pro Gly Thr Gly Val Ala Pro Phe Arg Gly
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Tyr Gln Glu Glu Leu Glu Asn Ala Gln Ser Glu Gly Ile Ile Thr Leu
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His Val Met Glu Gln Asp Gly Lys Lys Leu Ile Glu Leu Leu Asp Gln
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995 1000 1005

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1010 1015 1020

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Ala Asp Glu Leu Gly Glu Ile Phe Lys Phe Glu Ala Pro Gly Arg Val
35 40 45

Thr Arg Tyr Leu Ser Ser Gln Arg Leu Ile Lys Glu Ala Cys Asp Glu
50 55 60

Ser Arg Phe Asp Lys Asn Leu Ser Gln Ala Leu Lys Phe Val Arg Asp
65 70 75 80

Phe Ala Gly Asp Gly Leu Ala Thr Ser Trp Thr His Glu Lys Asn Trp
 85 90 95
 Lys Lys Ala His Asn Ile Leu Leu Pro Ser Phe Ser Gln Gln Ala Met
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 Lys Gly Tyr His Ala Met Met Val Asp Ile Ala Val Gln Leu Val Gln
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 Arg Phe Asn Ser Phe Tyr Arg Asp Gln Pro His Pro Phe Ile Thr Ser
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 Met Val Arg Ala Leu Asp Glu Ala Met Asn Lys Leu Gln Arg Ala Asn
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 Pro Asp Asp Pro Ala Tyr Asp Glu Asn Lys Arg Gln Phe Gln Glu Asp
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 Ile Lys Val Met Asn Asp Leu Val Asp Lys Ile Ile Ala Asp Arg Lys
 210 215 220
 Ala Ser Gly Glu Gln Ser Asp Asp Leu Leu Thr His Met Leu Asn Gly
 225 230 235 240
 Lys Asp Pro Glu Thr Gly Glu Pro Leu Asp Asp Glu Asn Ile Arg Tyr
 245 250 255
 Gln Ile Ile Thr Phe Leu Ile Ala Gly His Glu Thr Thr Ser Gly Leu
 260 265 270
 Leu Ser Phe Ala Leu Tyr Phe Leu Val Lys Asn Pro His Val Leu Gln
 275 280 285
 Lys Ala Ala Glu Glu Ala Ala Arg Val Leu Val Asp Pro Val Pro Ser
 290 295 300
 Tyr Lys Gln Val Lys Gln Leu Lys Tyr Val Gly Met Val Leu Asn Glu
 305 310 315 320
 Ala Leu Arg Leu Trp Pro Thr Ala Pro Ala Phe Ser Leu Tyr Ala Lys
 325 330 335
 Glu Asp Thr Val Leu Gly Gly Glu Tyr Pro Leu Glu Lys Gly Asp Glu
 340 345 350
 Leu Met Val Leu Ile Pro Gln Leu His Arg Asp Lys Thr Ile Trp Gly
 355 360 365
 Asp Asp Val Glu Glu Phe Arg Pro Glu Arg Phe Glu Asn Pro Ser Ala
 370 375 380
 Ile Pro Gln His Ala Phe Lys Pro Phe Gly Asn Gly Gln Arg Ala Cys
 385 390 395 400
 Ile Gly Gln Gln Phe Ala Leu His Glu Ala Thr Leu Val Leu Gly Met
 405 410 415
 Met Leu Lys His Phe Asp Phe Glu Asp His Thr Asn Tyr Glu Leu Asp
 420 425 430
 Ile Lys Glu Thr Leu Thr Leu Lys Pro Glu Gly Phe Val Val Lys Ala
 435 440 445
 Lys Ser Lys Lys Ile Pro Leu Gly Gly Ile Pro Ser Pro Ser Thr Glu
 450 455 460
 Gln Ser Ala Lys Lys Val Arg Lys Lys Ala Glu Asn Ala His Asn Thr
 465 470 475 480

Pro Leu Leu Val Leu Tyr Gly Ser Asn Met Gly Thr Ala Glu Gly Thr
 485 490 495
 Ala Arg Asp Leu Ala Asp Ile Ala Met Ser Lys Gly Phe Ala Pro Gln
 500 505 510
 Val Ala Thr Leu Asp Ser His Ala Gly Asn Leu Pro Arg Glu Gly Ala
 515 520 525
 Val Leu Ile Val Thr Ala Ser Tyr Asn Gly His Pro Pro Asp Asn Ala
 530 535 540
 Lys Gln Phe Val Asp Trp Leu Asp Gln Ala Ser Ala Asp Glu Val Lys
 545 550 555 560
 Gly Val Arg Tyr Ser Val Phe Gly Cys Gly Asp Lys Asn Trp Ala Thr
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 Phe Glu Gly Thr Tyr Glu Glu Trp Arg Glu His Met Trp Ser Asp Val
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 Arg Asn Tyr Glu Gly Ile Val Asn Arg Val Thr Ala Arg Phe Gly Leu
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 Asp Ala Ser Gln Gln Ile Arg Leu Glu Ala Glu Glu Glu Lys Leu Ala
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 His Leu Pro Leu Ala Lys Thr Val Ser Val Glu Glu Leu Leu Gln Tyr
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His Val Met Glu Gln Asp Gly Lys Lys Leu Ile Glu Leu Leu Asp Gln		
980	985	990
Gly Ala His Phe Tyr Ile Cys Gly Asp Gly Ser Gln Met Ala Pro Ala		
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1010	1015	1020
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Gly Arg Tyr Ala Lys Asp Val Trp Ala Gly		
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Leu Pro Leu Leu Asn Thr Asp Lys Pro Val Gln Ala Leu Met Lys Ile	
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gcg gat gaa tta gga gaa atc ttt aaa ttc gag gcg cct ggt cgt gta	144
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acg cgc tac tta tca agt cag cgt cta att aaa gaa gca tgc gat gaa	192
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tca cgc ttt gat aaa aac tta agt caa ggg ctt aaa ttt gta cgt gat	240
Ser Arg Phe Asp Lys Asn Leu Ser Gln Gly Leu Lys Phe Val Arg Asp	
65 70 75 80	
ttt gca gga gac ggg tta gtt aca agc tgg acg cat gaa aaa aat tgg	288
Phe Ala Gly Asp Gly Leu Val Thr Ser Trp Thr His Glu Lys Asn Trp	
85 90 95	
aaa aaa gcg cat aat atc tta ctt cca agc ttc agt cag cag gca atg	336
Lys Lys Ala His Asn Ile Leu Leu Pro Ser Phe Ser Gln Gln Ala Met	
100 105 110	

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cgc ttt aac agc ttt tac cga gat cag cct cat cca ttt att aca agt Arg Phe Asn Ser Phe Tyr Arg Asp Gln Pro His Pro Phe Ile Thr Ser 165 170 175	528
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caa att att aca ttc tta att gcg gga cac gaa aca aca agt ggt ctt Gln Ile Ile Thr Phe Leu Ile Ala Gly His Glu Thr Thr Ser Gly Leu 260 265 270	816
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aaa gca gca gaa gaa gca gca cga gtt cta gta gat cct gtt cca agc Lys Ala Ala Glu Glu Ala Ala Arg Val Leu Val Asp Pro Val Pro Ser 290 295 300	912
tac aaa caa gtc aaa cag ctt aaa tat gtc ggc atg gtc tta aac gaa Tyr Lys Gln Val Lys Gln Leu Lys Tyr Val Gly Met Val Leu Asn Glu 305 310 315 320	960
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Val Ala Thr Leu Asp Ser His Ala Gly Asn Leu Pro Arg Glu Gly Ala	
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Val Leu Ile Val Thr Ala Ser Tyr Asn Gly His Pro Pro Asp Asn Ala	
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Pro Lys Glu Ala Ser Tyr Gln Glu Gly Asp His Leu Gly Val Ile Pro	
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945 950 955 960	
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His Thr Ala Phe Ser Arg Met Pro Asn Gln Pro Lys Thr Tyr Val Gln	
965 970 975	
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His Val Met Glu Gln Asp Gly Lys Lys Leu Ile Glu Leu Leu Asp Gln	
980 985 990	
gga gcg cac ttc tat att tgc gga gac gga agc caa atg gca cct gcc	3024
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1010 1015 1020	

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Gln	Ile	Ile	Thr	Phe	Leu	Ile	Ala	Gly	His	Glu	Thr	Thr	Ser	Gly	Leu	
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 435 440 445
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 Gln Ser Ala Lys Lys Val Arg Lys Lys Ala Glu Asn Ala His Asn Thr
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 Ala Arg Asp Leu Ala Asp Ile Ala Met Ser Lys Gly Phe Ala Pro Gln
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 545 550 555 560
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 645 650 655
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 675 680 685
 Pro Lys Glu Ala Ser Tyr Gln Glu Gly Asp His Leu Gly Val Ile Pro
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 Phe Ile Ala Leu Leu Pro Ser Ile Arg Pro Arg Tyr Tyr Ser Ile Ser
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 Ser Ser Pro Arg Val Asp Glu Lys Gln Ala Ser Ile Thr Val Ser Val
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          100          105          110

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Ile Thr Pro Ile Trp Ser Gln Lys Ile Leu Ala Arg Ser Tyr Ala Ala
          115          120          125

tgg cca ttc gtc gag tac ggg ctc ttc ctg agc ctg gcc tac gcc gtg      432
Trp Pro Phe Val Glu Tyr Gly Leu Phe Leu Ser Leu Ala Tyr Ala Val
          130          135          140

cgc cag gcc atg tcc gac acg gtc cag ttc agc gtg gtg ttc cag gcc      480
Arg Gln Ala Met Ser Asp Thr Val Gln Phe Ser Val Val Phe Gln Ala
          145          150          155          160

gtg gac cgc atg cgg ctg ctc cag gac atc gtc cac cac ctg gac cac      528
Val Asp Arg Met Arg Leu Leu Gln Asp Ile Val His His Leu Asp His
          165          170          175

ctg cag gag tcg ccg gaa ttc agc gac gcc ggg gcc cgc gag gcc tgg      576
Leu Gln Glu Ser Pro Glu Phe Ser Asp Ala Gly Ala Arg Glu Ala Trp
          180          185          190

atg tcc gac tcc acc ctg gtc ccg atc cgg gaa gtg atc gag cgc atc      624
Met Ser Asp Ser Thr Leu Val Pro Ile Arg Glu Val Ile Glu Arg Ile
          195          200          205

gcc gcc agc cag gac tgg gtg gag atc ctg gtc gcc ggc acg ctc gtc      672
Ala Ala Ser Gln Asp Trp Val Glu Ile Leu Val Ala Gly Thr Leu Val
          210          215          220

ttc gag cct ctg gtc ggc cac ctg gcg aag gcc gag ttg ttc agc cgc      720
Phe Glu Pro Leu Val Gly His Leu Ala Lys Ala Glu Leu Phe Ser Arg
          225          230          235          240

cgt gcg cca atg ttc ggg gac ggg acc acg ccg gcg gtg ctg gcg tcg      768
Arg Ala Pro Met Phe Gly Asp Gly Thr Thr Pro Ala Val Leu Ala Ser
          245          250          255

gcc ctg ctg gac agc ggc agg cac ctc gaa tcg gtc cag gcg ctc gtc      816
Ala Leu Leu Asp Ser Gly Arg His Leu Glu Ser Val Gln Ala Leu Val
          260          265          270

cgc ctc gtc tgc caa gac ccc gtc cat ggc gac cag aac cag gcg act      864
Arg Leu Val Cys Gln Asp Pro Val His Gly Asp Gln Asn Gln Ala Thr
          275          280          285

gtg cgg cgg tgg atc gag gaa tgg cag ccg cgg tgc aag gcg gcg gcc      912
Val Arg Arg Trp Ile Glu Glu Trp Gln Pro Arg Cys Lys Ala Ala Ala

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290	295	300	
cag tcc ttc ctg ccg acg ttc tcc gac tgc ggc atc gac gcc aag gaa			960
Gln Ser Phe Leu Pro Thr Phe Ser Asp Cys Gly Ile Asp Ala Lys Glu			
305	310	315	320
agc gcc aac gcg ctg tcc cgg gcg ctg gcg aac cag cgg gcc gcc gtc			1008
Ser Ala Asn Ala Leu Ser Arg Ala Leu Ala Asn Gln Arg Ala Ala Val			
	325	330	335
gag ggc gcc ggc atc acg gca tga			1032
Glu Gly Ala Gly Ile Thr Ala			
	340		
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<211>	343		
<212>	PRT		
<213>	Nocardia corallina		
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Arg Thr Phe Thr Trp Phe Thr Pro Ala Arg Arg Lys Pro Thr Glu Tyr			
	20	25	30
Glu Leu Tyr Thr Val Gly Gln Gln Ser Thr Pro Asp Glu Trp Leu His			
	35	40	45
Val Asp Trp Pro Leu Arg Phe Asp Asp Gly Arg Ala Pro Trp Glu Glu			
	50	55	60
Glu Ser Ser Ala Val Arg Thr Ser Glu Trp Ser Ala Tyr Arg Asp Pro			
65	70	75	80
His Gln Leu Trp Gln Arg Pro Tyr Val Ser Thr Cys Asn Gln Asp Gln			
	85	90	95
Gln Ala Leu Ala Arg Leu Val Pro Val Leu Thr Met Gly Ser Ala Ala			
	100	105	110
Ile Thr Pro Ile Trp Ser Gln Lys Ile Leu Ala Arg Ser Tyr Ala Ala			
	115	120	125
Trp Pro Phe Val Glu Tyr Gly Leu Phe Leu Ser Leu Ala Tyr Ala Val			
	130	135	140
Arg Gln Ala Met Ser Asp Thr Val Gln Phe Ser Val Val Phe Gln Ala			
145	150	155	160
Val Asp Arg Met Arg Leu Leu Gln Asp Ile Val His His Leu Asp His			
	165	170	175
Leu Gln Glu Ser Pro Glu Phe Ser Asp Ala Gly Ala Arg Glu Ala Trp			
	180	185	190
Met Ser Asp Ser Thr Leu Val Pro Ile Arg Glu Val Ile Glu Arg Ile			
	195	200	205
Ala Ala Ser Gln Asp Trp Val Glu Ile Leu Val Ala Gly Thr Leu Val			
	210	215	220
Phe Glu Pro Leu Val Gly His Leu Ala Lys Ala Glu Leu Phe Ser Arg			
225	230	235	240
Arg Ala Pro Met Phe Gly Asp Gly Thr Thr Pro Ala Val Leu Ala Ser			
	245	250	255
Ala Leu Leu Asp Ser Gly Arg His Leu Glu Ser Val Gln Ala Leu Val			
	260	265	270
Arg Leu Val Cys Gln Asp Pro Val His Gly Asp Gln Asn Gln Ala Thr			
	275	280	285

Val Arg Arg Trp Ile Glu Glu Trp Gln Pro Arg Cys Lys Ala Ala Ala
 290 295 300

Gln Ser Phe Leu Pro Thr Phe Ser Asp Cys Gly Ile Asp Ala Lys Glu
 305 310 315 320

Ser Ala Asn Ala Leu Ser Arg Ala Leu Ala Asn Gln Arg Ala Ala Val
 325 330 335

Glu Gly Ala Gly Ile Thr Ala
 340

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 <211> 1506
 <212> DNA
 <213> Nocardia corallina

<220>
 <221> CDS
 <222> (1)..(1506)

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 Met Ala Ser Asn Pro Thr Gln Leu His Glu Lys Ser Lys Ser Tyr Asp
 1 5 10 15
 tgg gac ttc acc tcc gtc gag cgg cgc ccc aag ttc gag acg aag tac 96
 Trp Asp Phe Thr Ser Val Glu Arg Arg Pro Lys Phe Glu Thr Lys Tyr
 20 25 30
 aag atg ccc aag aag ggc aag gac ccg ttc cgc gtc ctg atc cgt gac 144
 Lys Met Pro Lys Lys Gly Lys Asp Pro Phe Arg Val Leu Ile Arg Asp
 35 40 45
 tac atg aag atg gaa gcg gag aag gac gac ccg acc cat ggc ttc ctc 192
 Tyr Met Lys Met Glu Ala Glu Lys Asp Asp Arg Thr His Gly Phe Leu
 50 55 60
 gac ggc gcc gtg cgg acg cgt gag gcc acc agg att gag ccg cgg ttc 240
 Asp Gly Ala Val Arg Thr Arg Glu Ala Thr Arg Ile Glu Pro Arg Phe
 65 70 75 80
 gct gag gcc atg aag atc atg gtg ccg cag ctg acc aac gcc gag tac 288
 Ala Glu Ala Met Lys Ile Met Val Pro Gln Leu Thr Asn Ala Glu Tyr
 85 90 95
 cag gcg gtg gcg ggc tgc gga atg atc atc tcg gcc gtc gag aac cag 336
 Gln Ala Val Ala Gly Cys Gly Met Ile Ile Ser Ala Val Glu Asn Gln
 100 105 110
 gag ctc cgt cag ggc tac gcc gct cag atg ctc gat gag gtg cgg cac 384
 Glu Leu Arg Gln Gly Tyr Ala Ala Gln Met Leu Asp Glu Val Arg His
 115 120 125
 gcg cag ctc gag atg acg cta cgc aac tac tac gcg aag cac tgg tgc 432
 Ala Gln Leu Glu Met Thr Leu Arg Asn Tyr Tyr Ala Lys His Trp Cys
 130 135 140
 gat ccc tcc ggc ttc gac atc ggt cag cgc ggc ctg tac cag cac ccc 480
 Asp Pro Ser Gly Phe Asp Ile Gly Gln Arg Gly Leu Tyr Gln His Pro
 145 150 155 160
 gcg ggg ctg gtg tcc atc ggc gag ttc cag cac ttc aat act ggt gac 528
 Ala Gly Leu Val Ser Ile Gly Glu Phe Gln His Phe Asn Thr Gly Asp
 165 170 175
 ccg ctt gac gtc atc atc gat ctc aac atc gtg gcc gag acg gcg ttc 576
 Pro Leu Asp Val Ile Ile Asp Leu Asn Ile Val Ala Glu Thr Ala Phe
 180 185 190
 acg aac atc ctg ctg gtg gcc act cca cag gtc gcc gtg gcc aac ggg 624
 Thr Asn Ile Leu Leu Val Ala Thr Pro Gln Val Ala Val Ala Asn Gly
 195 200 205

gac aac gcg atg gcc agc gtg ttc ctc tcg atc cag tcg gac gag gcc Asp Asn Ala Met Ala Ser Val Phe Leu Ser Ile Gln Ser Asp Glu Ala 210 215 220	672
agg cac atg gcc aac ggg tac ggc tcg gtc atg gcg ctg ctg gag aac Arg His Met Ala Asn Gly Tyr Gly Ser Val Met Ala Leu Leu Glu Asn 225 230 235 240	720
gag gac aac ctc ccg ctg ctc aac cag tct ctc gat cgg cac ttc tgg Glu Asp Asn Leu Pro Leu Leu Asn Gln Ser Leu Asp Arg His Phe Trp 245 250 255	768
cgt gcc cac aag gcc ttg gac aac gcg gtc gga tgg tgt tcg gag tat Arg Ala His Lys Ala Leu Asp Asn Ala Val Gly Trp Cys Ser Glu Tyr 260 265 270	816
ggc gcc cgc aag cgg cca tgg agc tac aag gcc cag tgg gag gaa tgg Gly Ala Arg Lys Arg Pro Trp Ser Tyr Lys Ala Gln Trp Glu Glu Trp 275 280 285	864
gtc gtc gac gac ttc gtg ggc ggc tac atc gac cga ctc agc gag ttc Val Val Asp Asp Phe Val Gly Gly Tyr Ile Asp Arg Leu Ser Glu Phe 290 295 300	912
ggc gtt cag gct ccg gcc tgc ctt ggc gcg gcc gcc gac gag gtc aag Gly Val Gln Ala Pro Ala Cys Leu Gly Ala Ala Ala Asp Glu Val Lys 305 310 315 320	960
tgg tcg cac cac acg ctc ggt cag gtg ctg tcg gcg gtg tgg ccg ctg Trp Ser His His Thr Leu Gly Gln Val Leu Ser Ala Val Trp Pro Leu 325 330 335	1008
aac ttc tgg cgc tcg gac gcc atg gga ccg gcg gac ttc gag tgg ttc Asn Phe Trp Arg Ser Asp Ala Met Gly Pro Ala Asp Phe Glu Trp Phe 340 345 350	1056
gag aac cac tac ccg ggc tgg agc gcg gcc tac cag ggt tac tgg gag Glu Asn His Tyr Pro Gly Trp Ser Ala Ala Tyr Gln Gly Tyr Trp Glu 355 360 365	1104
ggc tac aag gcg ctc gcc gac cca gca ggc gga cgc atc atg ctc cag Gly Tyr Lys Ala Leu Ala Asp Pro Ala Gly Gly Arg Ile Met Leu Gln 370 375 380	1152
gag ctg ccg ggt ctg ccg ccg atg tgt cag gtg tgc cag gtg ccg tgc Glu Leu Pro Gly Leu Pro Pro Met Cys Gln Val Cys Gln Val Pro Cys 385 390 395 400	1200
gtg atg ccg ccg ctg gat atg aac gcc gcg ccg atc atc gag ttc gag Val Met Pro Arg Leu Asp Met Asn Ala Ala Arg Ile Ile Glu Phe Glu 405 410 415	1248
ggg cag aaa atc gcg ctg tgc agc gaa ccc tgc cag ccg atc ttc acc Gly Gln Lys Ile Ala Leu Cys Ser Glu Pro Cys Gln Arg Ile Phe Thr 420 425 430	1296
aac tgg ccg gag gcg tac cgc cac cgc aag caa tac tgg gcc cgc tac Asn Trp Pro Glu Ala Tyr Arg His Arg Lys Gln Tyr Trp Ala Arg Tyr 435 440 445	1344
cac gga tgg gac ctg gcg gac gtc atc gtt gat ctc ggc tac atc cgc His Gly Trp Asp Leu Ala Asp Val Ile Val Asp Leu Gly Tyr Ile Arg 450 455 460	1392
ccg gac ggc aag acc ctc atc ggc cag ccg ctg ctc gag atg gag ccg Pro Asp Gly Lys Thr Leu Ile Gly Gln Pro Leu Leu Glu Met Glu Arg 465 470 475 480	1440
ctg tgg acc atc gac gac atc ccg gcc ctt cag tac gaa gtc aag gac Leu Trp Thr Ile Asp Asp Ile Arg Ala Leu Gln Tyr Glu Val Lys Asp 485 490 495	1488
ccg ttg cag gag gcg tga Pro Leu Gln Glu Ala 500	1506

<210> 12
 <211> 501
 <212> PRT
 <213> Nocardia corallina

<400> 12

Met	Ala	Ser	Asn	Pro	Thr	Gln	Leu	His	Glu	Lys	Ser	Lys	Ser	Tyr	Asp
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			20					25					30		
Lys	Met	Pro	Lys	Lys	Gly	Lys	Asp	Pro	Phe	Arg	Val	Leu	Ile	Arg	Asp
		35					40					45			
Tyr	Met	Lys	Met	Glu	Ala	Glu	Lys	Asp	Asp	Arg	Thr	His	Gly	Phe	Leu
	50					55					60				
Asp	Gly	Ala	Val	Arg	Thr	Arg	Glu	Ala	Thr	Arg	Ile	Glu	Pro	Arg	Phe
65					70					75					80
Ala	Glu	Ala	Met	Lys	Ile	Met	Val	Pro	Gln	Leu	Thr	Asn	Ala	Glu	Tyr
				85					90					95	
Gln	Ala	Val	Ala	Gly	Cys	Gly	Met	Ile	Ile	Ser	Ala	Val	Glu	Asn	Gln
			100					105					110		
Glu	Leu	Arg	Gln	Gly	Tyr	Ala	Ala	Gln	Met	Leu	Asp	Glu	Val	Arg	His
		115					120					125			
Ala	Gln	Leu	Glu	Met	Thr	Leu	Arg	Asn	Tyr	Tyr	Ala	Lys	His	Trp	Cys
		130				135					140				
Asp	Pro	Ser	Gly	Phe	Asp	Ile	Gly	Gln	Arg	Gly	Leu	Tyr	Gln	His	Pro
145					150					155					160
Ala	Gly	Leu	Val	Ser	Ile	Gly	Glu	Phe	Gln	His	Phe	Asn	Thr	Gly	Asp
				165					170					175	
Pro	Leu	Asp	Val	Ile	Ile	Asp	Leu	Asn	Ile	Val	Ala	Glu	Thr	Ala	Phe
			180					185					190		
Thr	Asn	Ile	Leu	Leu	Val	Ala	Thr	Pro	Gln	Val	Ala	Val	Ala	Asn	Gly
		195					200					205			
Asp	Asn	Ala	Met	Ala	Ser	Val	Phe	Leu	Ser	Ile	Gln	Ser	Asp	Glu	Ala
	210					215					220				
Arg	His	Met	Ala	Asn	Gly	Tyr	Gly	Ser	Val	Met	Ala	Leu	Leu	Glu	Asn
225					230					235					240
Glu	Asp	Asn	Leu	Pro	Leu	Leu	Asn	Gln	Ser	Leu	Asp	Arg	His	Phe	Trp
			245					250						255	
Arg	Ala	His	Lys	Ala	Leu	Asp	Asn	Ala	Val	Gly	Trp	Cys	Ser	Glu	Tyr
			260					265					270		
Gly	Ala	Arg	Lys	Arg	Pro	Trp	Ser	Tyr	Lys	Ala	Gln	Trp	Glu	Glu	Trp
		275					280					285			
Val	Val	Asp	Asp	Phe	Val	Gly	Gly	Tyr	Ile	Asp	Arg	Leu	Ser	Glu	Phe
		290				295					300				
Gly	Val	Gln	Ala	Pro	Ala	Cys	Leu	Gly	Ala	Ala	Ala	Asp	Glu	Val	Lys
305					310					315					320
Trp	Ser	His	His	Thr	Leu	Gly	Gln	Val	Leu	Ser	Ala	Val	Trp	Pro	Leu
				325					330					335	
Asn	Phe	Trp	Arg	Ser	Asp	Ala	Met	Gly	Pro	Ala	Asp	Phe	Glu	Trp	Phe
			340					345					350		
Glu	Asn	His	Tyr	Pro	Gly	Trp	Ser	Ala	Ala	Tyr	Gln	Gly	Tyr	Trp	Glu
		355					360					365			

Gly Tyr Lys Ala Leu Ala Asp Pro Ala Gly Gly Arg Ile Met Leu Gln
 370 375 380
 Glu Leu Pro Gly Leu Pro Pro Met Cys Gln Val Cys Gln Val Pro Cys
 385 390 395 400
 Val Met Pro Arg Leu Asp Met Asn Ala Ala Arg Ile Ile Glu Phe Glu
 405 410 415
 Gly Gln Lys Ile Ala Leu Cys Ser Glu Pro Cys Gln Arg Ile Phe Thr
 420 425 430
 Asn Trp Pro Glu Ala Tyr Arg His Arg Lys Gln Tyr Trp Ala Arg Tyr
 435 440 445
 His Gly Trp Asp Leu Ala Asp Val Ile Val Asp Leu Gly Tyr Ile Arg
 450 455 460
 Pro Asp Gly Lys Thr Leu Ile Gly Gln Pro Leu Leu Glu Met Glu Arg
 465 470 475 480
 Leu Trp Thr Ile Asp Asp Ile Arg Ala Leu Gln Tyr Glu Val Lys Asp
 485 490 495
 Pro Leu Gln Glu Ala
 500

<210> 13
 <211> 1494
 <212> DNA
 <213> Xanthobacta sp.

<220>
 <221> CDS
 <222> (1)..(1494)

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 gac tgg acg ctc agc tat gtc gac cgc gcg gtc gcc ttt ccc gag gag 96
 Asp Trp Thr Leu Ser Tyr Val Asp Arg Ala Val Ala Phe Pro Glu Glu
 20 25 30
 tgg aaa ggc gaa aag gac att tgc ggc acg gcc tgg gac gat tgg gac 144
 Trp Lys Gly Glu Lys Asp Ile Cys Gly Thr Ala Trp Asp Asp Trp Asp
 35 40 45
 gag ccc ttc cgg gtc tcc ttc cgc gaa tat gtg atg gtc cag cgc gac 192
 Glu Pro Phe Arg Val Ser Phe Arg Glu Tyr Val Met Val Gln Arg Asp
 50 55 60
 aag gaa gcg agc gtc ggc gcc atc cgc gag gcc atg gtc cgc gcc aag 240
 Lys Glu Ala Ser Val Gly Ala Ile Arg Glu Ala Met Val Arg Ala Lys
 65 70 75 80
 gcc tat gag aag ctc gac gac ggc cac aag gcc acc tcg cac ctg cac 288
 Ala Tyr Glu Lys Leu Asp Asp Gly His Lys Ala Thr Ser His Leu His
 85 90 95
 atg ggc acc atc acc atg gtg gag cac atg gcg gtc acc atg cag agc 336
 Met Gly Thr Ile Thr Met Val Glu His Met Ala Val Thr Met Gln Ser
 100 105 110
 cgg ttc gtg cgc ttc gcg ccg tcc gcc cgc tgg cgc agc ctc ggg gcg 384
 Arg Phe Val Arg Phe Ala Pro Ser Ala Arg Trp Arg Ser Leu Gly Ala
 115 120 125
 ttc ggc atg ctg gac gag acc cgc cac acc cag ctc gac ctg cgc ttc 432
 Phe Gly Met Leu Asp Glu Thr Arg His Thr Gln Leu Asp Leu Arg Phe
 130 135 140

agc cac gat ctg ctc aac gat tcc ccg agc ttc gac tgg agc cag cgg Ser His Asp Leu Leu Asn Asp Ser Pro Ser Phe Asp Trp Ser Gln Arg 145 150 155 160	480
gcg ttc cac acc gac gaa tgg gcg gtt ctc gcc acc cgc aac ctg ttc Ala Phe His Thr Asp Glu Trp Ala Val Leu Ala Thr Arg Asn Leu Phe 165 170 175	528
gac gac atc atg ctc aac gcc gac tgc gtg gag gcg gcg ctc gcc acc Asp Asp Ile Met Leu Asn Ala Asp Cys Val Glu Ala Ala Leu Ala Thr 180 185 190	576
agc ctg acg ctg gag cac ggc ttc acc aac atc cag ttc gtg gcg ctc Ser Leu Thr Leu Glu His Gly Phe Thr Asn Ile Gln Phe Val Ala Leu 195 200 205	624
gcc tcc gac gcc atg gaa gcc ggc gac gtg aac ttc tcc aac ctc ttg Ala Ser Asp Ala Met Glu Ala Gly Asp Val Asn Phe Ser Asn Leu Leu 210 215 220	672
tcg agc atc cag acc gac gag gcg cgg cac gcc cag ttg ggc ttt ccc Ser Ser Ile Gln Thr Asp Glu Ala Arg His Ala Gln Leu Gly Phe Pro 225 230 235 240	720
acc ctc gac gtg atg atg aag cac gac ccc aag cgc gcc cag cag atc Thr Leu Asp Val Met Met Lys His Asp Pro Lys Arg Ala Gln Gln Ile 245 250 255	768
ctg gac gtc gcc ttc tgg cgc tcc tac cgc atc ttc cag gcg gtg acc Leu Asp Val Ala Phe Trp Arg Ser Tyr Arg Ile Phe Gln Ala Val Thr 260 265 270	816
ggc gtc tcc atg gac tac tac acg ccg gtc gcc aag cgg cag atg tcg Gly Val Ser Met Asp Tyr Tyr Thr Pro Val Ala Lys Arg Gln Met Ser 275 280 285	864
ttc aag gag ttc atg ctg gag tgg atc gtc aag cat cat gag cgc atc Phe Lys Glu Phe Met Leu Glu Trp Ile Val Lys His His Glu Arg Ile 290 295 300	912
ctg cgc gac tac ggc ctc cag aag ccc tgg tac tgg gac acg ttc gag Leu Arg Asp Tyr Gly Leu Gln Lys Pro Trp Tyr Trp Asp Thr Phe Glu 305 310 315 320	960
aag acc ctc gat cac ggc cac cac gcg ctg cac atc ggc acc tgg ttc Lys Thr Leu Asp His Gly His His Ala Leu His Ile Gly Thr Trp Phe 325 330 335	1008
tgg cgc ccg acc ctg ttc tgg gat ccc aat ggc ggc gtc tcg cgc gag Trp Arg Pro Thr Leu Phe Trp Asp Pro Asn Gly Gly Val Ser Arg Glu 340 345 350	1056
gag cgg cgc tgg ctg aac cag aag tat ccg aac tgg gaa gag agc tgg Glu Arg Arg Trp Leu Asn Gln Lys Tyr Pro Asn Trp Glu Glu Ser Trp 355 360 365	1104
ggc gtc ctg tgg gac gag atc atc tcc aac atc aat gcg ggc aac att Gly Val Leu Trp Asp Glu Ile Ile Ser Asn Ile Asn Ala Gly Asn Ile 370 375 380	1152
gaa aag acc ttg ccc gag acg ctg ccg atg ctg tgc aac gtc acc aac Glu Lys Thr Leu Pro Glu Thr Leu Pro Met Leu Cys Asn Val Thr Asn 385 390 395 400	1200
ctg ccc atc ggc tcg cac tgg gac cgc ttc cac ctg aag ccc gag cag Leu Pro Ile Gly Ser His Trp Asp Arg Phe His Leu Lys Pro Glu Gln 405 410 415	1248
ctc gtc tac aag ggg cgg ctc tac acc ttc gac agc gac gtc tcc aag Leu Val Tyr Lys Gly Arg Leu Tyr Thr Phe Asp Ser Asp Val Ser Lys 420 425 430	1296
tgg atc ttc gag ctc gat ccg gag cgc tat gcc ggc cac acc aac gtg Trp Ile Phe Glu Leu Asp Pro Glu Arg Tyr Ala Gly His Thr Asn Val 435 440 445	1344

gtc gac cgc ttc atc ggc ggg cag atc cag ccc atg acc atc gag ggc 1392
Val Asp Arg Phe Ile Gly Gly Gln Ile Gln Pro Met Thr Ile Glu Gly
450 455 460

gtg ctc aac tgg atg ggc ctg acg ccc gaa gtc atg ggc aag gac gtg 1440
Val Leu Asn Trp Met Gly Leu Thr Pro Glu Val Met Gly Lys Asp Val
465 470 475 480

ttc aac tac cgt tgg gcc ggc gat tac gcc gag aac cgg atc gcc gcc 1488
Phe Asn Tyr Arg Trp Ala Gly Asp Tyr Ala Glu Asn Arg Ile Ala Ala
485 490 495

gag taa 1494
Glu

<210> 14
<211> 497
<212> PRT
<213> Xanthobacta sp.

<400> 14

Met Ala Leu Leu Asn Arg Asp Asp Trp Tyr Asp Ile Ala Arg Asp Val
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Asp Trp Thr Leu Ser Tyr Val Asp Arg Ala Val Ala Phe Pro Glu Glu
20 25 30

Trp Lys Gly Glu Lys Asp Ile Cys Gly Thr Ala Trp Asp Asp Trp Asp
35 40 45

Glu Pro Phe Arg Val Ser Phe Arg Glu Tyr Val Met Val Gln Arg Asp
50 55 60

Lys Glu Ala Ser Val Gly Ala Ile Arg Glu Ala Met Val Arg Ala Lys
65 70 75 80

Ala Tyr Glu Lys Leu Asp Asp Gly His Lys Ala Thr Ser His Leu His
85 90 95

Met Gly Thr Ile Thr Met Val Glu His Met Ala Val Thr Met Gln Ser
100 105 110

Arg Phe Val Arg Phe Ala Pro Ser Ala Arg Trp Arg Ser Leu Gly Ala
115 120 125

Phe Gly Met Leu Asp Glu Thr Arg His Thr Gln Leu Asp Leu Arg Phe
130 135 140

Ser His Asp Leu Leu Asn Asp Ser Pro Ser Phe Asp Trp Ser Gln Arg
145 150 155 160

Ala Phe His Thr Asp Glu Trp Ala Val Leu Ala Thr Arg Asn Leu Phe
165 170 175

Asp Asp Ile Met Leu Asn Ala Asp Cys Val Glu Ala Ala Leu Ala Thr
180 185 190

Ser Leu Thr Leu Glu His Gly Phe Thr Asn Ile Gln Phe Val Ala Leu
195 200 205

Ala Ser Asp Ala Met Glu Ala Gly Asp Val Asn Phe Ser Asn Leu Leu 210
215 220

Ser Ser Ile Gln Thr Asp Glu Ala Arg His Ala Gln Leu Gly Phe Pro
225 230 235 240

Thr Leu Asp Val Met Met Lys His Asp Pro Lys Arg Ala Gln Gln Ile
245 250 255

Leu Asp Val Ala Phe Trp Arg Ser Tyr Arg Ile Phe Gln Ala Val Thr
260 265 270

Gly Val Ser Met Asp Tyr Tyr Thr Pro Val Ala Lys Arg Gln Met Ser

275	280	285
Phe Lys Glu Phe Met Leu Glu Trp Ile Val Lys His His Glu Arg Ile 290	295	300
Leu Arg Asp Tyr Gly Leu Gln Lys Pro Trp Tyr Trp Asp Thr Phe Glu 305	310	315
Lys Thr Leu Asp His Gly His His Ala Leu His Ile Gly Thr Trp Phe 325	330	335
Trp Arg Pro Thr Leu Phe Trp Asp Pro Asn Gly Gly Val Ser Arg Glu 340	345	350
Glu Arg Arg Trp Leu Asn Gln Lys Tyr Pro Asn Trp Glu Glu Ser Trp 355	360	365
Gly Val Leu Trp Asp Glu Ile Ile Ser Asn Ile Asn Ala Gly Asn Ile 370	375	380
Glu Lys Thr Leu Pro Glu Thr Leu Pro Met Leu Cys Asn Val Thr Asn 385	390	395
Leu Pro Ile Gly Ser His Trp Asp Arg Phe His Leu Lys Pro Glu Gln 405	410	415
Leu Val Tyr Lys Gly Arg Leu Tyr Thr Phe Asp Ser Asp Val Ser Lys 420	425	430
Trp Ile Phe Glu Leu Asp Pro Glu Arg Tyr Ala Gly His Thr Asn Val 435	440	445
Val Asp Arg Phe Ile Gly Gly Gln Ile Gln Pro Met Thr Ile Glu Gly 450	455	460
Val Leu Asn Trp Met Gly Leu Thr Pro Glu Val Met Gly Lys Asp Val 465	470	475
Phe Asn Tyr Arg Trp Ala Gly Asp Tyr Ala Glu Asn Arg Ile Ala Ala 485	490	495

Glu

<210> 15
 <211> 1026
 <212> DNA
 <213> Xanthobacta sp.

<220>
 <221> CDS
 <222> (1)..(1026)

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acg gct ttc ggc aat ctc gga cgc aag ccg acc gac tac gag gtc gtc	96
Thr Ala Phe Gly Asn Leu Gly Arg Lys Pro Thr Asp Tyr Glu Val Val	
20 25 30	
acc cac aac atg aac cac acc atg cgc ggc acg ccc ctg gag ctg tcg	144
Thr His Asn Met Asn His Thr Met Arg Gly Thr Pro Leu Glu Leu Ser	
35 40 45	
ccg acg gtg cac gcc aat gtg tgg ctc aag aag aac cgc gac gag atc	192
Pro Thr Val His Ala Asn Val Trp Leu Lys Lys Asn Arg Asp Glu Ile	
50 55 60	
gcg ctc aag gtc gac agc tgg gat ctg ttc cgc gat ccc gac cgc acc	240
Ala Leu Lys Val Asp Ser Trp Asp Leu Phe Arg Asp Pro Asp Arg Thr	
65 70 75 80	

acc tac gac acc tac gtc aag atg cag gac gac cag gag acc tat gtc 288
 Thr Tyr Asp Thr Tyr Val Lys Met Gln Asp Asp Gln Glu Thr Tyr Val
 85 90 95

gac aac ctg ctc ctg tcc tac acc ggc gag ggc cgc tac gac gag gag 336
 Asp Asn Leu Leu Leu Ser Tyr Thr Gly Glu Gly Arg Tyr Asp Glu Glu
 100 105 110

ctt tcc tcg cgc agc ctc gac ctc ctg tcc gcg ggg ctg acg ccg acc 384
 Leu Ser Ser Arg Ser Leu Asp Leu Leu Ser Ala Gly Leu Thr Pro Thr
 115 120 125

cgc tat ctg ggc cat ggg ctg cag atg ctc gcg gcc tat atc cag cag 432
 Arg Tyr Leu Gly His Gly Leu Gln Met Leu Ala Ala Tyr Ile Gln Gln
 130 135 140

ctc gcc ccg tcg gcc tat gtg ggc aat tgc gcg gtg ttc cag acc tcc 480
 Leu Ala Pro Ser Ala Tyr Val Gly Asn Cys Ala Val Phe Gln Thr Ser
 145 150 155 160

gac gcg ctg cgc cgc gtg cag cgc gtc gcc tac cgc acc cgc cag ctc 528
 Asp Ala Leu Arg Arg Val Gln Arg Val Ala Tyr Arg Thr Arg Gln Leu
 165 170 175

gcc gac gcc cat ccg gcc cgc ggc ttc ggc tcc ggc gac cgg gcg gtg 576
 Ala Asp Ala His Pro Ala Arg Gly Phe Gly Ser Gly Asp Arg Ala Val
 180 185 190

tgg gag aag tcc ccg gac tgg cag ccc atc cgc aag gcc atc gag gag 624
 Trp Glu Lys Ser Pro Asp Trp Gln Pro Ile Arg Lys Ala Ile Glu Glu
 195 200 205

ctg ctc gtc acc ttc gaa tgg gac aag gcg ctc gcc ggc acc aat ttc 672
 Leu Leu Val Thr Phe Glu Trp Asp Lys Ala Leu Ala Gly Thr Asn Phe
 210 215 220

gtg gtg aag ccg atc ctc gac gag ctg ttc ctc aac cac ctg gcg cgc 720
 Val Val Lys Pro Ile Leu Asp Glu Leu Phe Leu Asn His Leu Ala Arg
 225 230 235 240

ctg ctc cac gtg gag ggc gac gag ctc gac agc ctc gtg ctg cgg aac 768
 Leu Leu His Val Glu Gly Asp Glu Leu Asp Ser Leu Val Leu Arg Asn
 245 250 255

ctt cac ggc gac gcc cag cgc cac gcc cgc tgg acg gcc gcg ctc ggc 816
 Leu His Gly Asp Ala Gln Arg His Ala Arg Trp Thr Ala Ala Leu Gly
 260 265 270

cgc ttc gcc gtc gag cag aac gtg aac aac cgc acg gtc ctg cgc gac 864
 Arg Phe Ala Val Glu Gln Asn Val Asn Asn Arg Thr Val Leu Arg Asp
 275 280 285

gcc atc gcc ggc tgg cac gag acc ggc gag gcg gtc ctc gcc gcg ggc 912
 Ala Ile Ala Gly Trp His Glu Thr Gly Glu Ala Val Leu Ala Ala Gly
 290 295 300

gcc ggg atg ctt gcg agc cgc gcc ccc agc gcg gat gcg gcc aag atc 960
 Ala Gly Met Leu Ala Ser Arg Ala Pro Ser Ala Asp Ala Ala Lys Ile
 305 310 315 320

gcc gac gag gtc cgc gcc acg ctc gcg cag ctg cac gcc aat gcg ggc 1008
 Ala Asp Glu Val Arg Ala Thr Leu Ala Gln Leu His Ala Asn Ala Gly
 325 330 335

ctc ggg cac gat gcc tga 1026
 Leu Gly His Asp Ala
 340

<210> 16
 <211> 341
 <212> PRT
 <213> Xanthobacta sp.

<400> 16

Met Thr Gln Gln Arg Pro Thr Arg Thr Arg Glu Arg Lys Lys Thr Trp
 1 5 10 15
 Thr Ala Phe Gly Asn Leu Gly Arg Lys Pro Thr Asp Tyr Glu Val Val
 20 25 30
 Thr His Asn Met Asn His Thr Met Arg Gly Thr Pro Leu Glu Leu Ser
 35 40 45
 Pro Thr Val His Ala Asn Val Trp Leu Lys Lys Asn Arg Asp Glu Ile
 50 55 60
 Ala Leu Lys Val Asp Ser Trp Asp Leu Phe Arg Asp Pro Asp Arg Thr
 65 70 75 80
 Thr Tyr Asp Thr Tyr Val Lys Met Gln Asp Asp Gln Glu Thr Tyr Val
 85 90 95
 Asp Asn Leu Leu Leu Ser Tyr Thr Gly Glu Gly Arg Tyr Asp Glu Glu
 100 105 110
 Leu Ser Ser Arg Ser Leu Asp Leu Leu Ser Ala Gly Leu Thr Pro Thr
 115 120 125
 Arg Tyr Leu Gly His Gly Leu Gln Met Leu Ala Ala Tyr Ile Gln Gln
 130 135 140
 Leu Ala Pro Ser Ala Tyr Val Gly Asn Cys Ala Val Phe Gln Thr Ser
 145 150 155 160
 Asp Ala Leu Arg Arg Val Gln Arg Val Ala Tyr Arg Thr Arg Gln Leu
 165 170 175
 Ala Asp Ala His Pro Ala Arg Gly Phe Gly Ser Gly Asp Arg Ala Val
 180 185 190
 Trp Glu Lys Ser Pro Asp Trp Gln Pro Ile Arg Lys Ala Ile Glu Glu
 195 200 205
 Leu Leu Val Thr Phe Glu Trp Asp Lys Ala Leu Ala Gly Thr Asn Phe
 210 215 220
 Val Val Lys Pro Ile Leu Asp Glu Leu Phe Leu Asn His Leu Ala Arg
 225 230 235 240
 Leu Leu His Val Glu Gly Asp Glu Leu Asp Ser Leu Val Leu Arg Asn
 245 250 255
 Leu His Gly Asp Ala Gln Arg His Ala Arg Trp Thr Ala Ala Leu Gly
 260 265 270
 Arg Phe Ala Val Glu Gln Asn Val Asn Asn Arg Thr Val Leu Arg Asp
 275 280 285
 Ala Ile Ala Gly Trp His Glu Thr Gly Glu Ala Val Leu Ala Ala Gly
 290 295 300
 Ala Gly Met Leu Ala Ser Arg Ala Pro Ser Ala Asp Ala Ala Lys Ile
 305 310 315 320
 Ala Asp Glu Val Arg Ala Thr Leu Ala Gln Leu His Ala Asn Ala Gly
 325 330 335
 Leu Gly His Asp Ala
 340

<210> 17
 <211> 267
 <212> DNA
 <213> Xanthobacta sp.

<220>
 <221> CDS
 <222> (1) .. (267)

<400> 17
 atg tct ttg ttc ccc atc gtg ggc cgc ttc gtg ggg gat ttc gtc ccc 48
 Met Ser Leu Phe Pro Ile Val Gly Arg Phe Val Gly Asp Phe Val Pro
 1 5 10 15
 cac ctg gtg gcg gtg gac acc tct gac acc atc gat cag atc gcc gag 96
 His Leu Val Ala Val Asp Thr Ser Asp Thr Ile Asp Gln Ile Ala Glu
 20 25 30
 aag gtg gcg gtc cac acg gtc ggg cgg cgc ttg ccg ccc gat ccc acc 144
 Lys Val Ala Val His Thr Val Gly Arg Arg Leu Pro Pro Asp Pro Thr
 35 40 45
 gcc acc ggc tat gag gtg ctc ctc gac ggc gag acc ctg gac ggg ggc 192
 Ala Thr Gly Tyr Glu Val Leu Leu Asp Gly Glu Thr Leu Asp Gly Gly
 50 55 60
 gcc acc ctg gag gcc atc atg acc aag cgc gag atg ctg ccc ctg cag 240
 Ala Thr Leu Glu Ala Ile Met Thr Lys Arg Glu Met Leu Pro Leu Gln
 65 70 75 80
 tgg ttc gac gtg agg ttc aag aag tga 267
 Trp Phe Asp Val Arg Phe Lys Lys
 85

<210> 18
 <211> 88
 <212> PRT
 <213> Xanthobacta sp.

<400> 18
 Met Ser Leu Phe Pro Ile Val Gly Arg Phe Val Gly Asp Phe Val Pro
 1 5 10 15
 His Leu Val Ala Val Asp Thr Ser Asp Thr Ile Asp Gln Ile Ala Glu
 20 25 30
 Lys Val Ala Val His Thr Val Gly Arg Arg Leu Pro Pro Asp Pro Thr
 35 40 45
 Ala Thr Gly Tyr Glu Val Leu Leu Asp Gly Glu Thr Leu Asp Gly Gly
 50 55 60
 Ala Thr Leu Glu Ala Ile Met Thr Lys Arg Glu Met Leu Pro Leu Gln
 65 70 75 80
 Trp Phe Asp Val Arg Phe Lys Lys
 85

<210> 19
 <211> 1584
 <212> DNA
 <213> Methylococcus capsulatas

<220>
 <221> CDS
 <222> (1) .. (1584)

<400> 19
 atg gca ctt agc acc gca acc aag gcc gcg acg gac gcg ctg gct gcc 48
 Met Ala Leu Ser Thr Ala Thr Lys Ala Ala Thr Asp Ala Leu Ala Ala
 1 5 10 15
 aat cgg gca ccc acc agc gtg aat gca cag gaa gtg cac cgt tgg ctc 96
 Asn Arg Ala Pro Thr Ser Val Asn Ala Gln Glu Val His Arg Trp Leu
 20 25 30
 cag agc ttc aac tgg gat ttc aag aac aac cgg acc aag tac gcc acc 144
 Gln Ser Phe Asn Trp Asp Phe Lys Asn Asn Arg Thr Lys Tyr Ala Thr
 35 40 45

aag tac aag atg gcg aac gag acc aag gaa cag ttc aag ctg atc gcc Lys Tyr Lys Met Ala Asn Glu Thr Lys Glu Gln Phe Lys Leu Ile Ala 50 55 60	192
aag gaa tat gcg cgc atg gag gca gtc aag gac gaa agg cag ttc ggt Lys Glu Tyr Ala Arg Met Glu Ala Val Lys Asp Glu Arg Gln Phe Gly 65 70 75 80	240
agc ctg cag gat gcg ctg acc cgc ctc aac gcc ggt gtt cgc gtt cat Ser Leu Gln Asp Ala Leu Thr Arg Leu Asn Ala Gly Val Arg Val His 85 90 95	288
ccg aag tgg aac gag acc atg aaa gtg gtt tcg aac ttc ctg gaa gtg Pro Lys Trp Asn Glu Thr Met Lys Val Val Ser Asn Phe Leu Glu Val 100 105 110	336
ggc gaa tac aac gcc atc gcc gct acc ggg atg ctg tgg gat tcc gcc Gly Glu Tyr Asn Ala Ile Ala Ala Thr Gly Met Leu Trp Asp Ser Ala 115 120 125	384
cag gcg gcg gaa cag aag aac ggc tat ctg gcc cag gtg ttg gat gaa Gln Ala Ala Glu Gln Lys Asn Gly Tyr Leu Ala Gln Val Leu Asp Glu 130 135 140	432
atc cgc cac acc cac cag tgt gcc tac gtc aac tac tac ttc gcg aag Ile Arg His Thr His Gln Cys Ala Tyr Val Asn Tyr Tyr Phe Ala Lys 145 150 155 160	480
aac ggc cag gac ccg gcc ggt cac aac gat gct cgc cgc acc cgt acc Asn Gly Gln Asp Pro Ala Gly His Asn Asp Ala Arg Arg Thr Arg Thr 165 170 175	528
atc ggt ccg ctg tgg aag ggc atg aag cgc gtg ttt tcc gac ggc ttc Ile Gly Pro Leu Trp Lys Gly Met Lys Arg Val Phe Ser Asp Gly Phe 180 185 190	576
att tcc ggc gac gcc gtg gaa tgc tcc ctc aac ctg cag ctg gtg ggt Ile Ser Gly Asp Ala Val Glu Cys Ser Leu Asn Leu Gln Leu Val Gly 195 200 205	624
gag gcc tgc ttc acc aat ccg ctg atc gtc gca gtg acc gaa tgg gct Glu Ala Cys Phe Thr Asn Pro Leu Ile Val Ala Val Thr Glu Trp Ala 210 215 220	672
gcc gcc aac ggc gat gaa atc acc ccg acg gtg ttc ctg tcg atc gag Ala Ala Asn Gly Asp Glu Ile Thr Pro Thr Val Phe Leu Ser Ile Glu 225 230 235 240	720
acc gac gaa ctg cgc cac atg gcc aac ggt tac cag acc gtc gtt tcc Thr Asp Glu Leu Arg His Met Ala Asn Gly Tyr Gln Thr Val Val Ser 245 250 255	768
atc gcc aac gat ccg gct tcc gcc aag tat ctc aac acg gac ctg aac Ile Ala Asn Asp Pro Ala Ser Ala Lys Tyr Leu Asn Thr Asp Leu Asn 260 265 270	816
aac gcc ttc tgg acc cag cag aag tac ttc acg ccg gtg ttg ggc atg Asn Ala Phe Trp Thr Gln Gln Lys Tyr Phe Thr Pro Val Leu Gly Met 275 280 285	864
ctg ttc gag tat ggc tcc aag ttc aag gtc gag ccg tgg gtc aag acg Leu Phe Glu Tyr Gly Ser Lys Phe Lys Val Glu Pro Trp Val Lys Thr 290 295 300	912
tgg gac cgc tgg gtg tac gag gac tgg ggc ggc atc tgg atc ggc cgt Trp Asp Arg Trp Val Tyr Glu Asp Trp Gly Gly Ile Trp Ile Gly Arg 305 310 315 320	960
ctg ggc aag tac ggg gtg gag tcg ccg cgc agc ctc aag gac gcc aag Leu Gly Lys Tyr Gly Val Glu Ser Pro Arg Ser Leu Lys Asp Ala Lys 325 330 335	1008
cag gac gct tac tgg gct cac cac gac ctg tat ctg ctg gct tat gcg Gln Asp Ala Tyr Trp Ala His His Asp Leu Tyr Leu Leu Ala Tyr Ala 340 345 350	1056

ctg tgg ccg acc ggc ttc ttc cgt ctg gcg ctg ccg gat cag gaa gaa 1104
 Leu Trp Pro Thr Gly Phe Phe Arg Leu Ala Leu Pro Asp Gln Glu Glu
 355 360 365
 atg gag tgg ttc gag gcc aac tac ccc ggc tgg tac gac cac tac ggc 1152
 Met Glu Trp Phe Glu Ala Asn Tyr Pro Gly Trp Tyr Asp His Tyr Gly
 370 375 380
 aag atc tac gag gaa tgg cgc gcc cgc ggt tgc gag gat ccg tcc tcg 1200
 Lys Ile Tyr Glu Glu Trp Arg Ala Arg Gly Cys Glu Asp Pro Ser Ser
 385 390 395 400
 ggc ttc atc ccg ctg atg tgg ttc atc gaa aac aac cat ccc atc tac 1248
 Gly Phe Ile Pro Leu Met Trp Phe Ile Glu Asn Asn His Pro Ile Tyr
 405 410 415
 atc gat cgc gtg tgc caa gtg ccg ttc tgc ccg agc ttg gcc aag ggc 1296
 Ile Asp Arg Val Ser Gln Val Pro Phe Cys Pro Ser Leu Ala Lys Gly
 420 425 430
 gcc agc acc ctg cgc gtg cac gag tac aac ggc gag atg cac acc ttc 1344
 Ala Ser Thr Leu Arg Val His Glu Tyr Asn Gly Glu Met His Thr Phe
 435 440 445
 agc gac cag tgg ggc gag cgc atg tgg ctg gcc gag ccg gag cgc tac 1392
 Ser Asp Gln Trp Gly Glu Arg Met Trp Leu Ala Glu Pro Glu Arg Tyr
 450 455 460
 gag tgc cag aac atc ttc gaa cag tac gaa gga cgc gaa ctg tgc gaa 1440
 Glu Cys Gln Asn Ile Phe Glu Gln Tyr Glu Gly Arg Glu Leu Ser Glu
 465 470 475 480
 gtg atc gcc gaa ctg cac ggg ctg cgc agt gat ggc aag acc ctg atc 1488
 Val Ile Ala Glu Leu His Gly Leu Arg Ser Asp Gly Lys Thr Leu Ile
 485 490 495
 gcc cag ccg cat gtc cgt ggc gac aag ctg tgg acg ttg gac gat atc 1536
 Ala Gln Pro His Val Arg Gly Asp Lys Leu Trp Thr Leu Asp Asp Ile
 500 505 510
 aaa cgc ctg aac tgc gtc ttc aag aac ccg gtg aag gca ttc aat tga 1584
 Lys Arg Leu Asn Cys Val Phe Lys Asn Pro Val Lys Ala Phe Asn
 515 520 525

<210> 20
 <211> 527
 <212> PRT
 <213> *Methylococcus capsulatas*

<400> 20

Met Ala Leu Ser Thr Ala Thr Lys Ala Ala Thr Asp Ala Leu Ala Ala
 1 5 10 15
 Asn Arg Ala Pro Thr Ser Val Asn Ala Gln Glu Val His Arg Trp Leu
 20 25 30
 Gln Ser Phe Asn Trp Asp Phe Lys Asn Asn Arg Thr Lys Tyr Ala Thr
 35 40 45
 Lys Tyr Lys Met Ala Asn Glu Thr Lys Glu Gln Phe Lys Leu Ile Ala
 50 55 60
 Lys Glu Tyr Ala Arg Met Glu Ala Val Lys Asp Glu Arg Gln Phe Gly
 65 70 75 80
 Ser Leu Gln Asp Ala Leu Thr Arg Leu Asn Ala Gly Val Arg Val His
 85 90 95
 Pro Lys Trp Asn Glu Thr Met Lys Val Val Ser Asn Phe Leu Glu Val
 100 105 110
 Gly Glu Tyr Asn Ala Ile Ala Ala Thr Gly Met Leu Trp Asp Ser Ala
 115 120 125

Gln Ala Ala Glu Gln Lys Asn Gly Tyr Leu Ala Gln Val Leu Asp Glu
 130 135 140
 Ile Arg His Thr His Gln Cys Ala Tyr Val Asn Tyr Tyr Phe Ala Lys
 145 150 155 160
 Asn Gly Gln Asp Pro Ala Gly His Asn Asp Ala Arg Arg Thr Arg Thr
 165 170 175
 Ile Gly Pro Leu Trp Lys Gly Met Lys Arg Val Phe Ser Asp Gly Phe
 180 185 190
 Ile Ser Gly Asp Ala Val Glu Cys Ser Leu Asn Leu Gln Leu Val Gly
 195 200 205
 Glu Ala Cys Phe Thr Asn Pro Leu Ile Val Ala Val Thr Glu Trp Ala
 210 215 220
 Ala Ala Asn Gly Asp Glu Ile Thr Pro Thr Val Phe Leu Ser Ile Glu
 225 230 235 240
 Thr Asp Glu Leu Arg His Met Ala Asn Gly Tyr Gln Thr Val Val Ser
 245 250 255
 Ile Ala Asn Asp Pro Ala Ser Ala Lys Tyr Leu Asn Thr Asp Leu Asn
 260 265 270
 Asn Ala Phe Trp Thr Gln Gln Lys Tyr Phe Thr Pro Val Leu Gly Met
 275 280 285
 Leu Phe Glu Tyr Gly Ser Lys Phe Lys Val Glu Pro Trp Val Lys Thr
 290 295 300
 Trp Asp Arg Trp Val Tyr Glu Asp Trp Gly Gly Ile Trp Ile Gly Arg
 305 310 315 320
 Leu Gly Lys Tyr Gly Val Glu Ser Pro Arg Ser Leu Lys Asp Ala Lys
 325 330 335
 Gln Asp Ala Tyr Trp Ala His His Asp Leu Tyr Leu Leu Ala Tyr Ala
 340 345 350
 Leu Trp Pro Thr Gly Phe Phe Arg Leu Ala Leu Pro Asp Gln Glu Glu
 355 360 365
 Met Glu Trp Phe Glu Ala Asn Tyr Pro Gly Trp Tyr Asp His Tyr Gly
 370 375 380
 Lys Ile Tyr Glu Glu Trp Arg Ala Arg Gly Cys Glu Asp Pro Ser Ser
 385 390 395 400
 Gly Phe Ile Pro Leu Met Trp Phe Ile Glu Asn Asn His Pro Ile Tyr
 405 410 415
 Ile Asp Arg Val Ser Gln Val Pro Phe Cys Pro Ser Leu Ala Lys Gly
 420 425 430
 Ala Ser Thr Leu Arg Val His Glu Tyr Asn Gly Glu Met His Thr Phe
 435 440 445
 Ser Asp Gln Trp Gly Glu Arg Met Trp Leu Ala Glu Pro Glu Arg Tyr
 450 455 460
 Glu Cys Gln Asn Ile Phe Glu Gln Tyr Glu Gly Arg Glu Leu Ser Glu
 465 470 475 480
 Val Ile Ala Glu Leu His Gly Leu Arg Ser Asp Gly Lys Thr Leu Ile
 485 490 495
 Ala Gln Pro His Val Arg Gly Asp Lys Leu Trp Thr Leu Asp Asp Ile
 500 505 510
 Lys Arg Leu Asn Cys Val Phe Lys Asn Pro Val Lys Ala Phe Asn
 515 520 525

<210> 21
 <211> 1170
 <212> DNA
 <213> Methylococcus capsulatas

<220>
 <221> CDS
 <222> (1) .. (1170)

<400> 21
 atg agc atg tta gga gaa aga cgc cgc ggt ctg acc gat ccg gaa atg 48
 Met Ser Met Leu Gly Glu Arg Arg Arg Gly Leu Thr Asp Pro Glu Met
 1 5 10 15

gcg gcc gtc att ttg aag gcg ctt cct gaa gct ccg ctg gac ggc aac 96
 Ala Ala Val Ile Leu Lys Ala Leu Pro Glu Ala Pro Leu Asp Gly Asn
 20 25 30

aac aag atg ggt tat ttc gtc acc ccc cgc tgg aaa cgc ttg acg gaa 144
 Asn Lys Met Gly Tyr Phe Val Thr Pro Arg Trp Lys Arg Leu Thr Glu
 35 40 45

tat gaa gcc ctg acc gtt tat gcg cag ccc aac gcc gac tgg atc gcc 192
 Tyr Glu Ala Leu Thr Val Tyr Ala Gln Pro Asn Ala Asp Trp Ile Ala
 50 55 60

ggc ggc ctg gac tgg ggc gac tgg acc cag aaa ttc cac ggc ggc cgc 240
 Gly Gly Leu Asp Trp Gly Asp Trp Thr Gln Lys Phe His Gly Gly Arg
 65 70 75 80

cct tcc tgg ggc aac gag acc acg gag ctg cgc acc gtc gac tgg ttc 288
 Pro Ser Trp Gly Asn Glu Thr Thr Glu Leu Arg Thr Val Asp Trp Phe
 85 90 95

aag cac cgt gac ccg ctc cgc cgt tgg cat gcg ccg tac gtc aag gac 336
 Lys His Arg Asp Pro Leu Arg Arg Trp His Ala Pro Tyr Val Lys Asp
 100 105 110

aag gcc gag gaa tgg cgc tac acc gac cgc ttc ctg cag ggt tac tcc 384
 Lys Ala Glu Glu Trp Arg Tyr Thr Asp Arg Phe Leu Gln Gly Tyr Ser
 115 120 125

gcc gac ggt cag atc cgg gcg atg aac ccg acc tgg cgg gac gag ttc 432
 Ala Asp Gly Gln Ile Arg Ala Met Asn Pro Thr Trp Arg Asp Glu Phe
 130 135 140

atc aac cgg tat tgg ggc gcc ttc ctg ttc aac gaa tac gga ttg ttc 480
 Ile Asn Arg Tyr Trp Gly Ala Phe Leu Phe Asn Glu Tyr Gly Leu Phe
 145 150 155 160

aac gct cat tcg cag ggc gcc cgg gag gcg ctg tcg gac gta acc cgc 528
 Asn Ala His Ser Gln Gly Ala Arg Glu Ala Leu Ser Asp Val Thr Arg
 165 170 175

gtc agc ctg gct ttc tgg ggc ttc gac aag atc gac atc gcc cag atg 576
 Val Ser Leu Ala Phe Trp Gly Phe Asp Lys Ile Asp Ile Ala Gln Met
 180 185 190

atc caa ctc gaa cgg ggt ttc ctc gcc aag atc gta ccc ggt ttc gac 624
 Ile Gln Leu Glu Arg Gly Phe Leu Ala Lys Ile Val Pro Gly Phe Asp
 195 200 205

gag tcc aca gcg gtg ccg aag gcc gaa tgg acg aac ggg gag gtc tac 672
 Glu Ser Thr Ala Val Pro Lys Ala Glu Trp Thr Asn Gly Glu Val Tyr
 210 215 220

aag agc gcc cgt ctg gcc gtg gaa ggg ctg tgg cag gag gtg ttc gac 720
 Lys Ser Ala Arg Leu Ala Val Glu Gly Leu Trp Gln Glu Val Phe Asp
 225 230 235 240

tgg aac gag agc gct ttc tcg gtg cac gcc gtc tat gac gcg ctg ttc 768
 Trp Asn Glu Ser Ala Phe Ser Val His Ala Val Tyr Asp Ala Leu Phe
 245 250 255

ggc cag ttc gtc cgc cgc gag ttc ttt cag cgg ctg gct ccc cgc ttc 816

Gly Gln Phe Val Arg Arg Glu Phe Phe Gln Arg Leu Ala Pro Arg Phe
 260 265 270
 ggc gac aat ctg acg cca ttc ttc atc aac cag gcc cag aca tac ttc 864
 Gly Asp Asn Leu Thr Pro Phe Phe Ile Asn Gln Ala Gln Thr Tyr Phe
 275 280 285
 cag atc gcc aag cag ggc gta cag gat ctg tat tac aac tgt ctg ggt 912
 Gln Ile Ala Lys Gln Gly Val Gln Asp Leu Tyr Tyr Asn Cys Leu Gly
 290 295 300
 gac gat ccg gag ttc agc gat tac aac cgt acc gtg atg cgc aac tgg 960
 Asp Asp Pro Glu Phe Ser Asp Tyr Asn Arg Thr Val Met Arg Asn Trp
 305 310 315 320
 acc ggc aag tgg ctg gag ccc acg atc gcc gct ctg cgc gac ttc atg 1008
 Thr Gly Lys Trp Leu Glu Pro Thr Ile Ala Ala Leu Arg Asp Phe Met
 325 330 335
 ggg ctg ttt gcg aag ctg ccg gcg ggc acc act gac aag gaa gaa atc 1056
 Gly Leu Phe Ala Lys Leu Pro Ala Gly Thr Thr Asp Lys Glu Glu Ile
 340 345 350
 acc gcg tcc ctg tac cgg gtg gtc gac gac tgg atc gag gac tac gcc 1104
 Thr Ala Ser Leu Tyr Arg Val Val Asp Asp Trp Ile Glu Asp Tyr Ala
 355 360 365
 agc gcg atc gac ttc aag gcg gac cgc gat cag atc gtt aaa gcg gtt 1152
 Ser Ala Ile Asp Phe Lys Ala Asp Arg Asp Gln Ile Val Lys Ala Val
 370 375 380
 ctg gca gga ttg aaa taa 1170
 Leu Ala Gly Leu Lys
 385

<210> 22
 <211> 389
 <212> PRT
 <213> *Methylococcus capsulatas*

<400> 22

Met Ser Met Leu Gly Glu Arg Arg Arg Gly Leu Thr Asp Pro Glu Met
 1 5 10 15
 Ala Ala Val Ile Leu Lys Ala Leu Pro Glu Ala Pro Leu Asp Gly Asn
 20 25 30
 Asn Lys Met Gly Tyr Phe Val Thr Pro Arg Trp Lys Arg Leu Thr Glu
 35 40 45
 Tyr Glu Ala Leu Thr Val Tyr Ala Gln Pro Asn Ala Asp Trp Ile Ala
 50 55 60
 Gly Gly Leu Asp Trp Gly Asp Trp Thr Gln Lys Phe His Gly Gly Arg
 65 70 75 80
 Pro Ser Trp Gly Asn Glu Thr Thr Glu Leu Arg Thr Val Asp Trp Phe
 85 90 95
 Lys His Arg Asp Pro Leu Arg Arg Trp His Ala Pro Tyr Val Lys Asp
 100 105 110
 Lys Ala Glu Glu Trp Arg Tyr Thr Asp Arg Phe Leu Gln Gly Tyr Ser
 115 120 125
 Ala Asp Gly Gln Ile Arg Ala Met Asn Pro Thr Trp Arg Asp Glu Phe
 130 135 140
 Ile Asn Arg Tyr Trp Gly Ala Phe Leu Phe Asn Glu Tyr Gly Leu Phe
 145 150 155 160
 Asn Ala His Ser Gln Gly Ala Arg Glu Ala Leu Ser Asp Val Thr Arg
 165 170 175

Val Ser Leu Ala Phe Trp Gly Phe Asp Lys Ile Asp Ile Ala Gln Met
 180 185 190
 Ile Gln Leu Glu Arg Gly Phe Leu Ala Lys Ile Val Pro Gly Phe Asp
 195 200 205
 Glu Ser Thr Ala Val Pro Lys Ala Glu Trp Thr Asn Gly Glu Val Tyr
 210 215 220
 Lys Ser Ala Arg Leu Ala Val Glu Gly Leu Trp Gln Glu Val Phe Asp
 225 230 235 240
 Trp Asn Glu Ser Ala Phe Ser Val His Ala Val Tyr Asp Ala Leu Phe
 245 250 255
 Gly Gln Phe Val Arg Arg Glu Phe Phe Gln Arg Leu Ala Pro Arg Phe
 260 265 270
 Gly Asp Asn Leu Thr Pro Phe Phe Ile Asn Gln Ala Gln Thr Tyr Phe
 275 280 285
 Gln Ile Ala Lys Gln Gly Val Gln Asp Leu Tyr Tyr Asn Cys Leu Gly
 290 295 300
 Asp Asp Pro Glu Phe Ser Asp Tyr Asn Arg Thr Val Met Arg Asn Trp
 305 310 315 320
 Thr Gly Lys Trp Leu Glu Pro Thr Ile Ala Ala Leu Arg Asp Phe Met
 325 330 335
 Gly Leu Phe Ala Lys Leu Pro Ala Gly Thr Thr Asp Lys Glu Glu Ile
 340 345 350
 Thr Ala Ser Leu Tyr Arg Val Val Asp Asp Trp Ile Glu Asp Tyr Ala
 355 360 365
 Ser Ala Ile Asp Phe Lys Ala Asp Arg Asp Gln Ile Val Lys Ala Val
 370 375 380
 Leu Ala Gly Leu Lys
 385

<210> 23
 <211> 513
 <212> DNA
 <213> Methylococcus capsulatas

<220>
 <221> CDS
 <222> (1) .. (513)

<400> 23
 atg gcg aaa ctg ggt ata cac agc aac gac acc cgc gac gcc tgg gtg 48
 Met Ala Lys Leu Gly Ile His Ser Asn Asp Thr Arg Asp Ala Trp Val
 1 5 10 15
 aac aag atc gcg cag ctc aac acc ctg gaa aaa gcg gcc gag atg ctg 96
 Asn Lys Ile Ala Gln Leu Asn Thr Leu Glu Lys Ala Ala Glu Met Leu
 20 25 30
 aag cag ttc cgg atg gac cac acc acg ccg ttc cgc aac agc tac gaa 144
 Lys Gln Phe Arg Met Asp His Thr Thr Pro Phe Arg Asn Ser Tyr Glu
 35 40 45
 ctg gac aac gac tac ctc tgg atc gag gcc aag ctc gaa gag aag gtc 192
 Leu Asp Asn Asp Tyr Leu Trp Ile Glu Ala Lys Leu Glu Glu Lys Val
 50 55 60
 gcc gtc ctc aag gca cgc gcc ttc aac gag gtg gac ttc cgt cat aag 240
 Ala Val Leu Lys Ala Arg Ala Phe Asn Glu Val Asp Phe Arg His Lys
 65 70 75 80
 acc gct ttc ggc gag gat gcc aag tcc gtt ctg gac ggc acc gtc gcg 288
 Thr Ala Phe Gly Glu Asp Ala Lys Ser Val Leu Asp Gly Thr Val Ala

	85	90	95	
aag atg aac gcg gcc aag gac aag tgg gag gcg gag aag atc cat atc				336
Lys Met Asn Ala Ala Lys Asp Lys Trp Glu Ala Glu Lys Ile His Ile				
	100	105	110	
ggt ttc cgc cag gcc tac aag ccg ccg atc atg ccg gtg aac tat ttc				384
Gly Phe Arg Gln Ala Tyr Lys Pro Pro Ile Met Pro Val Asn Tyr Phe				
	115	120	125	
ctg gac ggc gag cgt cag ttg ggg acc ccg ctg atg gaa ctg cgc aac				432
Leu Asp Gly Glu Arg Gln Leu Gly Thr Arg Leu Met Glu Leu Arg Asn				
	130	135	140	
ctc aac tac tac gac acg ccg ctg gaa gaa ctg cgc aaa cag cgc ggt				480
Leu Asn Tyr Tyr Asp Thr Pro Leu Glu Glu Leu Arg Lys Gln Arg Gly				
	145	150	155	160
gtg cgg gtg gtg cat ctg cag tcc ccg cac tga				513
Val Arg Val Val His Leu Gln Ser Pro His				
	165	170		
<210>	24			
<211>	170			
<212>	PRT			
<213>	Methylococcus capsulatas			
<400>	24			
Met Ala Lys Leu Gly Ile His Ser Asn Asp Thr Arg Asp Ala Trp Val				
1	5	10	15	
Asn Lys Ile Ala Gln Leu Asn Thr Leu Glu Lys Ala Ala Glu Met Leu				
	20	25	30	
Lys Gln Phe Arg Met Asp His Thr Thr Pro Phe Arg Asn Ser Tyr Glu				
	35	40	45	
Leu Asp Asn Asp Tyr Leu Trp Ile Glu Ala Lys Leu Glu Glu Lys Val				
	50	55	60	
Ala Val Leu Lys Ala Arg Ala Phe Asn Glu Val Asp Phe Arg His Lys				
	65	70	75	80
Thr Ala Phe Gly Glu Asp Ala Lys Ser Val Leu Asp Gly Thr Val Ala				
	85	90	95	
Lys Met Asn Ala Ala Lys Asp Lys Trp Glu Ala Glu Lys Ile His Ile				
	100	105	110	
Gly Phe Arg Gln Ala Tyr Lys Pro Pro Ile Met Pro Val Asn Tyr Phe				
	115	120	125	
Leu Asp Gly Glu Arg Gln Leu Gly Thr Arg Leu Met Glu Leu Arg Asn				
	130	135	140	
Leu Asn Tyr Tyr Asp Thr Pro Leu Glu Glu Leu Arg Lys Gln Arg Gly				
	145	150	155	160
Val Arg Val Val His Leu Gln Ser Pro His				
	165	170		
<210>	25			
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<213>	Pseudomonas oleovorans			
<220>				
<221>	CDS			
<222>	(1) .. (1206)			
<400>	25			
atg ctt gag aaa cac aga gtt ctg gat tcc gct cca gag tac gta gat				48

Met	Leu	Glu	Lys	His	Arg	Val	Leu	Asp	Ser	Ala	Pro	Glu	Tyr	Val	Asp	
1				5					10					15		
aaa aag aaa tat ctc tgg ata cta tca act ttg tgg ccg gct act ccg																96
Lys	Lys	Lys	Tyr	Leu	Trp	Ile	Leu	Ser	Thr	Leu	Trp	Pro	Ala	Thr	Pro	
			20					25					30			
atg	atc	gga	atc	tgg	ctt	gca	aat	gaa	act	ggg	tgg	ggg	att	ttt	tat	144
Met	Ile	Gly	Ile	Trp	Leu	Ala	Asn	Glu	Thr	Gly	Trp	Gly	Ile	Phe	Tyr	
		35					40					45				
ggg	ctg	gta	ttg	ctc	gta	tgg	tac	ggc	gca	ctt	cca	ttg	ctt	gat	gcg	192
Gly	Leu	Val	Leu	Leu	Val	Trp	Tyr	Gly	Ala	Leu	Pro	Leu	Leu	Asp	Ala	
		50				55					60					
atg	ttt	ggg	gag	gac	ttt	aat	aat	ccg	cct	gaa	gaa	gtg	gtg	ccg	aaa	240
Met	Phe	Gly	Glu	Asp	Phe	Asn	Asn	Pro	Pro	Glu	Glu	Val	Val	Pro	Lys	
65					70				75					80		
cta	gag	aag	gag	cgg	tac	tat	cga	gtt	ttg	aca	tat	cta	aca	gtt	cct	288
Leu	Glu	Lys	Glu	Arg	Tyr	Tyr	Arg	Val	Leu	Thr	Tyr	Leu	Thr	Val	Pro	
				85				90						95		
atg	cat	tac	gct	gca	tta	att	gtg	tca	gca	tgg	tgg	gtc	gga	act	cag	336
Met	His	Tyr	Ala	Ala	Leu	Ile	Val	Ser	Ala	Trp	Trp	Val	Gly	Thr	Gln	
			100					105					110			
cca	atg	tct	tgg	ctt	gaa	att	ggg	gcg	ctt	gcc	ttg	tca	ctg	ggg	atc	384
Pro	Met	Ser	Trp	Leu	Glu	Ile	Gly	Ala	Leu	Ala	Leu	Ser	Leu	Gly	Ile	
		115					120					125				
gtg	aac	gga	cta	gcg	ctc	aat	aca	gga	cac	gaa	ctc	ggg	cac	aag	aag	432
Val	Asn	Gly	Leu	Ala	Leu	Asn	Thr	Gly	His	Glu	Leu	Gly	His	Lys	Lys	
	130					135					140					
gag	act	ttt	gat	cgt	tgg	atg	gcc	aaa	att	gtg	ttg	gct	gtc	gta	ggg	480
Glu	Thr	Phe	Asp	Arg	Trp	Met	Ala	Lys	Ile	Val	Leu	Ala	Val	Val	Gly	
145					150				155					160		
tac	ggg	cac	ttc	ttt	att	gag	cat	aat	aag	ggg	cat	cac	cgt	gat	gtc	528
Tyr	Gly	His	Phe	Phe	Ile	Glu	His	Asn	Lys	Gly	His	His	Arg	Asp	Val	
				165				170						175		
gct	aca	ccg	atg	gat	cct	gca	aca	tcc	cgg	atg	gga	gaa	agc	att	tat	576
Ala	Thr	Pro	Met	Asp	Pro	Ala	Thr	Ser	Arg	Met	Gly	Glu	Ser	Ile	Tyr	
			180					185					190			
aag	ttt	tca	atc	cgt	gag	atc	cca	gga	gca	ttt	att	cgt	gct	tgg	ggg	624
Lys	Phe	Ser	Ile	Arg	Glu	Ile	Pro	Gly	Ala	Phe	Ile	Arg	Ala	Trp	Gly	
		195					200					205				
ctt	gag	gaa	caa	cgc	ctt	tcg	cgc	cgt	ggc	caa	agc	gtt	tgg	agt	ttc	672
Leu	Glu	Glu	Gln	Arg	Leu	Ser	Arg	Arg	Gly	Gln	Ser	Val	Trp	Ser	Phe	
		210				215					220					
gat	aat	gaa	atc	ctc	caa	cca	atg	atc	atc	aca	gtt	att	ctt	tac	gcc	720
Asp	Asn	Glu	Ile	Leu	Gln	Pro	Met	Ile	Ile	Thr	Val	Ile	Leu	Tyr	Ala	
225					230				235					240		
gtt	ctc	ctt	gcc	ttg	ttt	gga	cct	aag	atg	ctg	gtg	ttc	ctg	ccg	att	768
Val	Leu	Leu	Ala	Leu	Phe	Gly	Pro	Lys	Met	Leu	Val	Phe	Leu	Pro	Ile	
			245					250					255			
caa	atg	gct	ttc	ggg	tgg	tgg	cag	ctg	acc	agt	gcg	aac	tat	att	gaa	816
Gln	Met	Ala	Phe	Gly	Trp	Trp	Gln	Leu	Thr	Ser	Ala	Asn	Tyr	Ile	Glu	
			260				265					270				
cat	tac	ggc	ttg	ctc	cgt	caa	aaa	atg	gag	gac	ggg	cga	tat	gag	cat	864
His	Tyr	Gly	Leu	Leu	Arg	Gln	Lys	Met	Glu	Asp	Gly	Arg	Tyr	Glu	His	
		275				280					285					
caa	aag	ccg	cac	cat	tct	tgg	aat	agt	aat	cac	atc	gtc	tct	aat	cta	912
Gln	Lys	Pro	His	His	Ser	Trp	Asn	Ser	Asn	His	Ile	Val	Ser	Asn	Leu	
		290				295					300					
gtg	ctg	ttc	cac	ctt	cag	cgg	cac	tcg	gat	cac	cac	gcg	cat	cca	aca	960

Val Leu Phe His Leu Gln Arg His Ser Asp His His Ala His Pro Thr
 305 310 315 320
 cgt tct tat cag tca ctt cgg gat ttt ccc ggc ctg ccg gct ctt ccg 1008
 Arg Ser Tyr Gln Ser Leu Arg Asp Phe Pro Gly Leu Pro Ala Leu Pro
 325 330 335
 acg ggt tac cct ggt gca ttt ttg atg gcg atg att cct cag tgg ttt 1056
 Thr Gly Tyr Pro Gly Ala Phe Leu Met Ala Met Ile Pro Gln Trp Phe
 340 345 350
 aga tca gtt atg gat ccc aag gta gta gat tgg gct ggt ggt gac ctt 1104
 Arg Ser Val Met Asp Pro Lys Val Val Asp Trp Ala Gly Gly Asp Leu
 355 360 365
 aat aag atc caa att gat gat tcg atg cga gaa acc tat ttg aaa aaa 1152
 Asn Lys Ile Gln Ile Asp Asp Ser Met Arg Glu Thr Tyr Leu Lys Lys
 370 375 380
 ttt ggc act agt agt gct ggt cat agt tcg agt acc tct gcg gta gca 1200
 Phe Gly Thr Ser Ser Ala Gly His Ser Ser Ser Thr Ser Ala Val Ala
 385 390 395 400
 tcg tag 1206
 Ser

 <210> 26
 <211> 401
 <212> PRT
 <213> Pseudomonas oleovorans

 <400> 26
 Met Leu Glu Lys His Arg Val Leu Asp Ser Ala Pro Glu Tyr Val Asp
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 Lys Lys Lys Tyr Leu Trp Ile Leu Ser Thr Leu Trp Pro Ala Thr Pro
 20 25 30
 Met Ile Gly Ile Trp Leu Ala Asn Glu Thr Gly Trp Gly Ile Phe Tyr
 35 40 45
 Gly Leu Val Leu Leu Val Trp Tyr Gly Ala Leu Pro Leu Leu Asp Ala
 50 55 60
 Met Phe Gly Glu Asp Phe Asn Asn Pro Pro Glu Glu Val Val Pro Lys
 65 70 75 80
 Leu Glu Lys Glu Arg Tyr Tyr Arg Val Leu Thr Tyr Leu Thr Val Pro
 85 90 95
 Met His Tyr Ala Ala Leu Ile Val Ser Ala Trp Trp Val Gly Thr Gln
 100 105 110
 Pro Met Ser Trp Leu Glu Ile Gly Ala Leu Ala Leu Ser Leu Gly Ile
 115 120 125
 Val Asn Gly Leu Ala Leu Asn Thr Gly His Glu Leu Gly His Lys Lys
 130 135 140
 Glu Thr Phe Asp Arg Trp Met Ala Lys Ile Val Leu Ala Val Val Gly
 145 150 155 160
 Tyr Gly His Phe Phe Ile Glu His Asn Lys Gly His His Arg Asp Val
 165 170 175
 Ala Thr Pro Met Asp Pro Ala Thr Ser Arg Met Gly Glu Ser Ile Tyr
 180 185 190
 Lys Phe Ser Ile Arg Glu Ile Pro Gly Ala Phe Ile Arg Ala Trp Gly
 195 200 205
 Leu Glu Glu Gln Arg Leu Ser Arg Arg Gly Gln Ser Val Trp Ser Phe
 210 215 220

Asp Asn Glu Ile Leu Gln Pro Met Ile Ile Thr Val Ile Leu Tyr Ala
 225 230 235 240
 Val Leu Leu Ala Leu Phe Gly Pro Lys Met Leu Val Phe Leu Pro Ile
 245 250 255
 Gln Met Ala Phe Gly Trp Trp Gln Leu Thr Ser Ala Asn Tyr Ile Glu
 260 265 270
 His Tyr Gly Leu Leu Arg Gln Lys Met Glu Asp Gly Arg Tyr Glu His
 275 280 285
 Gln Lys Pro His His Ser Trp Asn Ser Asn His Ile Val Ser Asn Leu
 290 295 300
 Val Leu Phe His Leu Gln Arg His Ser Asp His His Ala His Pro Thr
 305 310 315 320
 Arg Ser Tyr Gln Ser Leu Arg Asp Phe Pro Gly Leu Pro Ala Leu Pro
 325 330 335
 Thr Gly Tyr Pro Gly Ala Phe Leu Met Ala Met Ile Pro Gln Trp Phe
 340 345 350
 Arg Ser Val Met Asp Pro Lys Val Val Asp Trp Ala Gly Gly Asp Leu
 355 360 365
 Asn Lys Ile Gln Ile Asp Asp Ser Met Arg Glu Thr Tyr Leu Lys Lys
 370 375 380
 Phe Gly Thr Ser Ser Ala Gly His Ser Ser Ser Thr Ser Ala Val Ala
 385 390 395 400
 Ser

<210> 27
 <211> 1560
 <212> DNA
 <213> Burkholderia cepacia

<220>
 <221> CDS
 <222> (1)..(1560)

<400> 27
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 gca gcg atg acc cgc ggt ctt ggc tgg cag acc agc tac cag ccg atg 96
 Ala Ala Met Thr Arg Gly Leu Gly Trp Gln Thr Ser Tyr Gln Pro Met
 20 25 30
 gag aaa gtg ttt ccg tac gac aag tac gaa ggc atc aag atc cac gat 144
 Glu Lys Val Phe Pro Tyr Asp Lys Tyr Glu Gly Ile Lys Ile His Asp
 35 40 45
 tgg gat aaa tgg gaa gac ccc ttc cgc ctg acc atg gac gcc tac tgg 192
 Trp Asp Lys Trp Glu Asp Pro Phe Arg Leu Thr Met Asp Ala Tyr Trp
 50 55 60
 aaa tat cag ggc gag aag gaa aaa aag ctt tac gcc gtc atc gac gct 240
 Lys Tyr Gln Gly Glu Lys Glu Lys Lys Leu Tyr Ala Val Ile Asp Ala
 65 70 75 80
 ttc gcg cag aac aac ggg cag ttg agc att tcc gac gcg cga tat gtc 288
 Phe Ala Gln Asn Asn Gly Gln Leu Ser Ile Ser Asp Ala Arg Tyr Val
 85 90 95
 aac gca ctc aag gtg ttt atc cag ggt gtg aca ccg ttg gag tat atg 336
 Asn Ala Leu Lys Val Phe Ile Gln Gly Val Thr Pro Leu Glu Tyr Met

100	105	110	
gca cac cga ggt ttt gcc cac att ggt cgg cat ttt acg ggt gaa ggg Ala His Arg Gly Phe Ala His Ile Gly Arg His Phe Thr Gly Glu Gly 115 120 125			384
gca cgt gtt gct tgc cag atg cag tcc atc gac gag ctg cgt cac ttc Ala Arg Val Ala Cys Gln Met Gln Ser Ile Asp Glu Leu Arg His Phe 130 135 140			432
cag acc gaa atg cat gct ctc tcg cac tac aac aag tat ttt aac ggt Gln Thr Glu Met His Ala Leu Ser His Tyr Asn Lys Tyr Phe Asn Gly 145 150 155 160			480
ctg cac aac tcc atc cat tgg tac gac cgg gtt tgg tat ttg tcg gtg Leu His Asn Ser Ile His Trp Tyr Asp Arg Val Trp Tyr Leu Ser Val 165 170 175			528
ccc aag tca ttt ttt gaa gac gcg gcc acc ggt gga ccg ttc gag ttt Pro Lys Ser Phe Phe Glu Asp Ala Ala Thr Gly Gly Pro Phe Glu Phe 180 185 190			576
ctt acc gcg gtg agc ttt tcg ttc gaa tat gtg ttg acc aac ctg ctg Leu Thr Ala Val Ser Phe Ser Phe Glu Tyr Val Leu Thr Asn Leu Leu 195 200 205			624
ttt gtc ccc ttc atg tcg ggt gct gct tac aac ggg gac atg tct acg Phe Val Pro Phe Met Ser Gly Ala Ala Tyr Asn Gly Asp Met Ser Thr 210 215 220			672
gtc act ttc ggt ttt tcg gcg caa agt gac gaa tcg cgc cac atg aca Val Thr Phe Gly Phe Ser Ala Gln Ser Asp Glu Ser Arg His Met Thr 225 230 235 240			720
ctc ggc atc gaa tgc atc aag ttc atg cta gaa cag gat ccg gac aac Leu Gly Ile Glu Cys Ile Lys Phe Met Leu Glu Gln Asp Pro Asp Asn 245 250 255			768
gtg ccc atc gtg cag cgc tgg atc gac aag tgg ttc tgg cgc ggc tat Val Pro Ile Val Gln Arg Trp Ile Asp Lys Trp Phe Trp Arg Gly Tyr 260 265 270			816
cgg ctg ttg agc atc gtg gcc atg atg cag gac tac atg ctg ccc aac Arg Leu Leu Ser Ile Val Ala Met Met Gln Asp Tyr Met Leu Pro Asn 275 280 285			864
cgg gtg atg agc tgg cgc gag agc tgg gag atg tac gtc gag cag aac Arg Val Met Ser Trp Arg Glu Ser Trp Glu Met Tyr Val Glu Gln Asn 290 295 300			912
ggc ggc gcg ctg ttc aag gat ctt gcg cgt tat ggc atc cgc aag ccc Gly Gly Ala Leu Phe Lys Asp Leu Ala Arg Tyr Gly Ile Arg Lys Pro 305 310 315 320			960
aag ggc tgg gac cag gct tgc gaa ggc aag gac cac atc agc cat cag Lys Gly Trp Asp Gln Ala Cys Glu Gly Lys Asp His Ile Ser His Gln 325 330 335			1008
acc ttc gcc gta ttc tat aac tat aac gcc gcg gcc ccc atc cac acc Thr Phe Ala Val Phe Tyr Asn Tyr Asn Ala Ala Ala Pro Ile His Thr 340 345 350			1056
tgg gtt ccc aca aaa gaa gaa atg gga tgg ctg tcg gag aag tac ccc Trp Val Pro Thr Lys Glu Glu Met Gly Trp Leu Ser Glu Lys Tyr Pro 355 360 365			1104
gag acg ttc gac aag tat tac cgt ccg cgt tgg gac tac tgg cgc gag Glu Thr Phe Asp Lys Tyr Tyr Arg Pro Arg Trp Asp Tyr Trp Arg Glu 370 375 380			1152
cag gcc gcc aag ggc aac cgt ttc tac aac aag acg ctg ccg atg ctc Gln Ala Ala Lys Gly Asn Arg Phe Tyr Asn Lys Thr Leu Pro Met Leu 385 390 395 400			1200
tgc act acc tgc cag att ccg atg ata ttc acc gag cct ggc gac gca Cys Thr Thr Cys Gln Ile Pro Met Ile Phe Thr Glu Pro Gly Asp Ala			1248

405	410	415	
acc aag atc tgc tat cgc gag tcg gcc tac ctc ggc gac aag tat cac			1296
Thr Lys Ile Cys Tyr Arg Glu Ser Ala Tyr Leu Gly Asp Lys Tyr His			
420	425	430	
ttc tgc agc gac cac tgc aag gag att ttt gac aac gaa ccc gaa aag			1344
Phe Cys Ser Asp His Cys Lys Glu Ile Phe Asp Asn Glu Pro Glu Lys			
435	440	445	
ttc gtg cag tca tgg ctt ccg ccg cag caa gtg tat caa gga aac tgt			1392
Phe Val Gln Ser Trp Leu Pro Pro Gln Gln Val Tyr Gln Gly Asn Cys			
450	455	460	
ttc aag ccg gat gcc gat ccg acc aag gag ggt ttt gat ccc ttg atg			1440
Phe Lys Pro Asp Ala Asp Pro Thr Lys Glu Gly Phe Asp Pro Leu Met			
465	470	475	480
gcc ttg ctc gac tac tac aac ctg aat gta ggc cgg gac aac ttc gat			1488
Ala Leu Leu Asp Tyr Tyr Asn Leu Asn Val Gly Arg Asp Asn Phe Asp			
485	490	495	
ttc gag gga tcg gaa gac caa aag aac ttt gct gcc tgg cgt gga gag			1536
Phe Glu Gly Ser Glu Asp Gln Lys Asn Phe Ala Ala Trp Arg Gly Glu			
500	505	510	
gtc ttg caa gga gaa gcc aaa tga			1560
Val Leu Gln Gly Glu Ala Lys			
515			
<210> 28			
<211> 519			
<212> PRT			
<213> Burkholderia cepacia			
<400> 28			
Met Asp Thr Ser Val Gln Lys Lys Lys Leu Gly Leu Lys Asn Arg Tyr			
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Ala Ala Met Thr Arg Gly Leu Gly Trp Gln Thr Ser Tyr Gln Pro Met			
20	25	30	
Glu Lys Val Phe Pro Tyr Asp Lys Tyr Glu Gly Ile Lys Ile His Asp			
35	40	45	
Trp Asp Lys Trp Glu Asp Pro Phe Arg Leu Thr Met Asp Ala Tyr Trp			
50	55	60	
Lys Tyr Gln Gly Glu Lys Glu Lys Lys Leu Tyr Ala Val Ile Asp Ala			
65	70	75	80
Phe Ala Gln Asn Asn Gly Gln Leu Ser Ile Ser Asp Ala Arg Tyr Val			
85	90	95	
Asn Ala Leu Lys Val Phe Ile Gln Gly Val Thr Pro Leu Glu Tyr Met			
100	105	110	
Ala His Arg Gly Phe Ala His Ile Gly Arg His Phe Thr Gly Glu Gly			
115	120	125	
Ala Arg Val Ala Cys Gln Met Gln Ser Ile Asp Glu Leu Arg His Phe			
130	135	140	
Gln Thr Glu Met His Ala Leu Ser His Tyr Asn Lys Tyr Phe Asn Gly			
145	150	155	160
Leu His Asn Ser Ile His Trp Tyr Asp Arg Val Trp Tyr Leu Ser Val			
165	170	175	
Pro Lys Ser Phe Phe Glu Asp Ala Ala Thr Gly Gly Pro Phe Glu Phe			
180	185	190	
Leu Thr Ala Val Ser Phe Ser Phe Glu Tyr Val Leu Thr Asn Leu Leu			
195	200	205	

Phe Val Pro Phe Met Ser Gly Ala Ala Tyr Asn Gly Asp Met Ser Thr
 210 215 220
 Val Thr Phe Gly Phe Ser Ala Gln Ser Asp Glu Ser Arg His Met Thr
 225 230 235 240
 Leu Gly Ile Glu Cys Ile Lys Phe Met Leu Glu Gln Asp Pro Asp Asn
 245 250 255
 Val Pro Ile Val Gln Arg Trp Ile Asp Lys Trp Phe Trp Arg Gly Tyr
 260 265 270
 Arg Leu Leu Ser Ile Val Ala Met Met Gln Asp Tyr Met Leu Pro Asn
 275 280 285
 Arg Val Met Ser Trp Arg Glu Ser Trp Glu Met Tyr Val Glu Gln Asn
 290 295 300
 Gly Gly Ala Leu Phe Lys Asp Leu Ala Arg Tyr Gly Ile Arg Lys Pro
 305 310 315 320
 Lys Gly Trp Asp Gln Ala Cys Glu Gly Lys Asp His Ile Ser His Gln
 325 330 335
 Thr Phe Ala Val Phe Tyr Asn Tyr Asn Ala Ala Ala Pro Ile His Thr
 340 345 350
 Trp Val Pro Thr Lys Glu Glu Met Gly Trp Leu Ser Glu Lys Tyr Pro
 355 360 365
 Glu Thr Phe Asp Lys Tyr Tyr Arg Pro Arg Trp Asp Tyr Trp Arg Glu
 370 375 380
 Gln Ala Ala Lys Gly Asn Arg Phe Tyr Asn Lys Thr Leu Pro Met Leu
 385 390 395 400
 Cys Thr Thr Cys Gln Ile Pro Met Ile Phe Thr Glu Pro Gly Asp Ala
 405 410 415
 Thr Lys Ile Cys Tyr Arg Glu Ser Ala Tyr Leu Gly Asp Lys Tyr His
 420 425 430
 Phe Cys Ser Asp His Cys Lys Glu Ile Phe Asp Asn Glu Pro Glu Lys
 435 440 445
 Phe Val Gln Ser Trp Leu Pro Pro Gln Gln Val Tyr Gln Gly Asn Cys
 450 455 460
 Phe Lys Pro Asp Ala Asp Pro Thr Lys Glu Gly Phe Asp Pro Leu Met
 465 470 475 480
 Ala Leu Leu Asp Tyr Tyr Asn Leu Asn Val Gly Arg Asp Asn Phe Asp
 485 490 495
 Phe Glu Gly Ser Glu Asp Gln Lys Asn Phe Ala Ala Trp Arg Gly Glu
 500 505 510
 Val Leu Gln Gly Glu Ala Lys
 515

<210> 29
 <211> 996
 <212> DNA
 <213> Burkholderia cepacia

<220>
 <221> CDS
 <222> (1)..(996)

<400> 29
 atg acc atc gat ttg aag acg cgg gaa atc aaa cca ctg cgt cac acc
 Met Thr Ile Asp Leu Lys Thr Arg Glu Ile Lys Pro Leu Arg His Thr
 1 5 10 15

tac acg cac gtg gct caa tac atc ggg gcc gat aaa gcc gct tcg cgc Tyr Thr His Val Ala Gln Tyr Ile Gly Ala Asp Lys Ala Ala Ser Arg 20 25 30	96
tat cag gaa ggc act gta ggt gct caa ccc gca gcg aat ttt cat tac Tyr Gln Glu Gly Thr Val Gly Ala Gln Pro Ala Ala Asn Phe His Tyr 35 40 45	144
cgg ccc acg tgg gat ccc gag cat gaa ctg ttc gac acg tcg cgt acc Arg Pro Thr Trp Asp Pro Glu His Glu Leu Phe Asp Thr Ser Arg Thr 50 55 60	192
gcg att caa atg aag gac tgg tat gcg ctg aaa gac ccg cgt cag ttc Ala Ile Gln Met Lys Asp Trp Tyr Ala Leu Lys Asp Pro Arg Gln Phe 65 70 75 80	240
tac tac gcg tcg tgg acg atg acc cga gcg cgg cag caa gac gcg atg Tyr Tyr Ala Ser Trp Thr Met Thr Arg Ala Arg Gln Gln Asp Ala Met 85 90 95	288
gaa tcc aac ttc gag ttt gtc gag tcg cgc ggc atg atc gat ctc gtt Glu Ser Asn Phe Glu Phe Val Glu Ser Arg Gly Met Ile Asp Leu Val 100 105 110	336
tcc gat gag gtt cga caa cgg gcg ctt tcc gtt ctc gtg cct ttg cgt Ser Asp Glu Val Arg Gln Arg Ala Leu Ser Val Leu Val Pro Leu Arg 115 120 125	384
cac gcg gcc tgg ggc gcg aac atg aac aac tcc cag atc tgt gcc cta His Ala Ala Trp Gly Ala Asn Met Asn Asn Ser Gln Ile Cys Ala Leu 130 135 140	432
ggg tat ggc acg acc ttc act gcg ccg gct atg ttc cac gca atg gac Gly Tyr Gly Thr Thr Phe Thr Ala Pro Ala Met Phe His Ala Met Asp 145 150 155 160	480
aat ctg ggt gta gcg cag tat ctc aca cga ctg gcg ctg gta atg tct Asn Leu Gly Val Ala Gln Tyr Leu Thr Arg Leu Ala Leu Val Met Ser 165 170 175	528
gga ccc gat ctt ctt gac gaa gcc aag caa gcc tgg atg acg agt ccc Gly Pro Asp Leu Leu Asp Glu Ala Lys Gln Ala Trp Met Thr Ser Pro 180 185 190	576
gat tgg caa ccg ttg cgt cgt tat gtg gaa aac act ctg gtg ctg caa Asp Trp Gln Pro Leu Arg Arg Tyr Val Glu Asn Thr Leu Val Leu Gln 195 200 205	624
gat ccg gtg gaa ctg ttc atc gcc caa aat ctg gcg ctc gac ggt ctt Asp Pro Val Glu Leu Phe Ile Ala Gln Asn Leu Ala Leu Asp Gly Leu 210 215 220	672
ctt tat ccc atg atc tac ggc gct ttc gtc gac gat tac atc gca ctc Leu Tyr Pro Met Ile Tyr Gly Ala Phe Val Asp Asp Tyr Ile Ala Leu 225 230 235 240	720
aac ggt ggt agc gca gtg gca atg cta acc act ttc atg ccc gag tgg Asn Gly Gly Ser Ala Val Ala Met Leu Thr Thr Phe Met Pro Glu Trp 245 250 255	768
cat gac gaa tcc agt cgc tgg gtc gat gcg gta gta aag acc atg gcg His Asp Glu Ser Ser Arg Trp Val Asp Ala Val Val Lys Thr Met Ala 260 265 270	816
acg gaa tcg gag gat aac aaa gcg ctg ctc att cac tgg ttg cgt acc Thr Glu Ser Glu Asp Asn Lys Ala Leu Leu Ile His Trp Leu Arg Thr 275 280 285	864
tgg gaa gat cag gcg gcg tca gcg ttg ttg cct gtc gct gaa atg gct Trp Glu Asp Gln Ala Ala Ser Ala Leu Leu Pro Val Ala Glu Met Ala 290 295 300	912
ttg gcg gaa aac ggc cac gac gcc ttg gaa gaa gta agg cag caa ctt Leu Ala Glu Asn Gly His Asp Ala Leu Glu Glu Val Arg Gln Gln Leu 305 310 315 320	960

cgt gcc cgc gtt gcg aag gcc ggg att gtt ctg taa
 Arg Ala Arg Val Ala Lys Ala Gly Ile Val Leu
 325 330

996

<210> 30
 <211> 331
 <212> PRT
 <213> Burkholderia cepacia

<400> 30

Met Thr Ile Asp Leu Lys Thr Arg Glu Ile Lys Pro Leu Arg His Thr
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 Tyr Thr His Val Ala Gln Tyr Ile Gly Ala Asp Lys Ala Ala Ser Arg
 20 25 30
 Tyr Gln Glu Gly Thr Val Gly Ala Gln Pro Ala Ala Asn Phe His Tyr
 35 40 45
 Arg Pro Thr Trp Asp Pro Glu His Glu Leu Phe Asp Thr Ser Arg Thr
 50 55 60
 Ala Ile Gln Met Lys Asp Trp Tyr Ala Leu Lys Asp Pro Arg Gln Phe
 65 70 75 80
 Tyr Tyr Ala Ser Trp Thr Met Thr Arg Ala Arg Gln Gln Asp Ala Met
 85 90 95
 Glu Ser Asn Phe Glu Phe Val Glu Ser Arg Gly Met Ile Asp Leu Val
 100 105 110
 Ser Asp Glu Val Arg Gln Arg Ala Leu Ser Val Leu Val Pro Leu Arg
 115 120 125
 His Ala Ala Trp Gly Ala Asn Met Asn Asn Ser Gln Ile Cys Ala Leu
 130 135 140
 Gly Tyr Gly Thr Thr Phe Thr Ala Pro Ala Met Phe His Ala Met Asp
 145 150 155 160
 Asn Leu Gly Val Ala Gln Tyr Leu Thr Arg Leu Ala Leu Val Met Ser
 165 170 175
 Gly Pro Asp Leu Leu Asp Glu Ala Lys Gln Ala Trp Met Thr Ser Pro
 180 185 190
 Asp Trp Gln Pro Leu Arg Arg Tyr Val Glu Asn Thr Leu Val Leu Gln
 195 200 205
 Asp Pro Val Glu Leu Phe Ile Ala Gln Asn Leu Ala Leu Asp Gly Leu
 210 215 220
 Leu Tyr Pro Met Ile Tyr Gly Ala Phe Val Asp Asp Tyr Ile Ala Leu
 225 230 235 240
 Asn Gly Gly Ser Ala Val Ala Met Leu Thr Thr Phe Met Pro Glu Trp
 245 250 255
 His Asp Glu Ser Ser Arg Trp Val Asp Ala Val Val Lys Thr Met Ala
 260 265 270
 Thr Glu Ser Glu Asp Asn Lys Ala Leu Leu Ile His Trp Leu Arg Thr
 275 280 285
 Trp Glu Asp Gln Ala Ala Ser Ala Leu Leu Pro Val Ala Glu Met Ala
 290 295 300
 Leu Ala Glu Asn Gly His Asp Ala Leu Glu Glu Val Arg Gln Gln Leu
 305 310 315 320
 Arg Ala Arg Val Ala Lys Ala Gly Ile Val Leu
 325 330

<210> 31
 <211> 357
 <212> DNA
 <213> Burkholderia cepacia

<220>
 <221> CDS
 <222> (1)..(357)

<400> 31
 atg agc gtt gtt gcc ctc aaa ccc tac aag ttc ccg gca cga gac gcg 48
 Met Ser Val Val Ala Leu Lys Pro Tyr Lys Phe Pro Ala Arg Asp Ala
 1 5 10 15
 cgc gaa aac ttt ccg gcg ccg ttg ctg ttt atc ggc tgg gaa gac cat 96
 Arg Glu Asn Phe Pro Ala Pro Leu Leu Phe Ile Gly Trp Glu Asp His
 20 25 30
 ctg ttg ttt gcg gca cct gtt gcc ttg ccc ctg ccg tcg gac acg ttg 144
 Leu Leu Phe Ala Ala Pro Val Ala Leu Pro Leu Pro Ser Asp Thr Leu
 35 40 45
 ttc ggt gcg ctg tgc acc cag gtg ttg ccc ggc act tat ggc tat cac 192
 Phe Gly Ala Leu Cys Thr Gln Val Leu Pro Gly Thr Tyr Gly Tyr His
 50 55 60
 ccc gat ttc tca aag atc gac tgg agc cag gtg cag tgg ttt aag tcc 240
 Pro Asp Phe Ser Lys Ile Asp Trp Ser Gln Val Gln Trp Phe Lys Ser
 65 70 75 80
 ggc cag ccg tgg cat ccc gac ccg gcg aag tcg ctg gct gaa aac ggt 288
 Gly Gln Pro Trp His Pro Asp Pro Ala Lys Ser Leu Ala Glu Asn Gly
 85 90 95
 ctg acg cac aaa gac gtg atc cgc ttt cgc acg cct ggc ttg aac ggt 336
 Leu Thr His Lys Asp Val Ile Arg Phe Arg Thr Pro Gly Leu Asn Gly
 100 105 110
 ctg agc ggt tcc tgc aat tga 357
 Leu Ser Gly Ser Cys Asn
 115

<210> 32
 <211> 118
 <212> PRT
 <213> Burkholderia cepacia

<400> 32
 Met Ser Val Val Ala Leu Lys Pro Tyr Lys Phe Pro Ala Arg Asp Ala
 1 5 10 15
 Arg Glu Asn Phe Pro Ala Pro Leu Leu Phe Ile Gly Trp Glu Asp His
 20 25 30
 Leu Leu Phe Ala Ala Pro Val Ala Leu Pro Leu Pro Ser Asp Thr Leu
 35 40 45
 Phe Gly Ala Leu Cys Thr Gln Val Leu Pro Gly Thr Tyr Gly Tyr His
 50 55 60
 Pro Asp Phe Ser Lys Ile Asp Trp Ser Gln Val Gln Trp Phe Lys Ser
 65 70 75 80
 Gly Gln Pro Trp His Pro Asp Pro Ala Lys Ser Leu Ala Glu Asn Gly
 85 90 95
 Leu Thr His Lys Asp Val Ile Arg Phe Arg Thr Pro Gly Leu Asn Gly
 100 105 110
 Leu Ser Gly Ser Cys Asn
 115

<210> 33
 <211> 1143
 <212> DNA
 <213> *Bacillus stearothermophilus*

<220>
 <221> CDS
 <222> (1)..(1143)

<400> 33
 atg gaa aaa aat aaa atg tta ata gaa gaa aag ttg gac act gct gct 48
 Met Glu Lys Asn Lys Met Leu Ile Glu Glu Lys Leu Asp Thr Ala Ala
 1 5 10 15
 ctt ctt gct aag gcg gag gaa ata ggc cgg att gct gag gaa gag gcg 96
 Leu Leu Ala Lys Ala Glu Glu Ile Gly Arg Ile Ala Glu Glu Glu Ala
 20 25 30
 ggt gaa gcg gac cgc aat gcc tgt ttc tcc gac cgg gtg gct agg gcc 144
 Gly Glu Ala Asp Arg Asn Ala Cys Phe Ser Asp Arg Val Ala Arg Ala
 35 40 45
 att aaa gaa gct gga ttc cac aag ctc atg cgt ccc aag cag tac gga 192
 Ile Lys Glu Ala Gly Phe His Lys Leu Met Arg Pro Lys Gln Tyr Gly
 50 55 60
 gga ctg caa gta gac ttg cga act tac ggg gag att gtc cgc aca gtg 240
 Gly Leu Gln Val Asp Leu Arg Thr Tyr Gly Glu Ile Val Arg Thr Val
 65 70 75 80
 gcc cgg tac agt gtt gcc gca gga tgg ctg acc tat ttt tat tcc atg 288
 Ala Arg Tyr Ser Val Ala Ala Gly Trp Leu Thr Tyr Phe Tyr Ser Met
 85 90 95
 cat gag gtt tgg gct gca tat ctg cct cca aaa ggc aga gaa gaa att 336
 His Glu Val Trp Ala Ala Tyr Leu Pro Pro Lys Gly Arg Glu Glu Ile
 100 105 110
 ttt gga caa gga ggg ctg ttg gca gac gtc gtt gcc cct gtt ggc cgg 384
 Phe Gly Gln Gly Gly Leu Leu Ala Asp Val Val Ala Pro Val Gly Arg
 115 120 125
 gtg gag aag gac ggg gac ggc tac cgt ctc tat ggg cag tgg aac ttc 432
 Val Glu Lys Asp Gly Asp Gly Tyr Arg Leu Tyr Gly Gln Trp Asn Phe
 130 135 140
 tgt agc ggt gtc ctc cat agt gac tgg atc gga ctt ggc gcc atg atg 480
 Cys Ser Gly Val Leu His Ser Asp Trp Ile Gly Leu Gly Ala Met Met
 145 150 155 160
 gag ctg cct gac ggc aat agt cct gag tac tgt ttg tta gtg ctg cct 528
 Glu Leu Pro Asp Gly Asn Ser Pro Glu Tyr Cys Leu Leu Val Leu Pro
 165 170 175
 aag tcg gat gtc cag atc gta gaa aat tgg gat acc atg ggc ctc cgc 576
 Lys Ser Asp Val Gln Ile Val Glu Asn Trp Asp Thr Met Gly Leu Arg
 180 185 190
 gct tcg gga agc aac ggg gta tta gtt gaa ggt gct tat gtt cca tta 624
 Ala Ser Gly Ser Asn Gly Val Leu Val Glu Gly Ala Tyr Val Pro Leu
 195 200 205
 cac cgg atc ttt ccg gct ggc cgg gtg atg gct cat ccg ctt ttc ttg 672
 His Arg Ile Phe Pro Ala Gly Arg Val Met Ala His Pro Leu Phe Leu
 210 215 220
 ctt ggg ttc cct tta gta tct tta ggc ggc gac gaa cga ttg gtg tca 720
 Leu Gly Phe Pro Leu Val Ser Leu Gly Gly Asp Glu Arg Leu Val Ser
 225 230 235 240
 ctt ttc caa gaa cgc act gag aag cgc att cgt gtc ttc aaa ggc ggc 768
 Leu Phe Gln Glu Arg Thr Glu Lys Arg Ile Arg Val Phe Lys Gly Gly
 245 250 255

gcg aaa gaa aag gat tct gcc gct agc cag cgg ctg tta gcc gag atg 816
 Ala Lys Glu Lys Asp Ser Ala Ala Ser Gln Arg Leu Leu Ala Glu Met
 260 265 270

aaa aca gaa tta aat gca atg gaa ggc att gtg gaa caa tat atc cgc 864
 Lys Thr Glu Leu Asn Ala Met Glu Gly Ile Val Glu Gln Tyr Ile Arg
 275 280 285

cag ctt gag gct tgc caa aaa gaa gga aag acg gtg atg aac gat atg 912
 Gln Leu Glu Ala Cys Gln Lys Glu Gly Lys Thr Val Met Asn Asp Met
 290 295 300

gag cga gag cag cta ttc gca tgg cgt gga tat gtg gca aaa gcg tcc 960
 Glu Arg Glu Gln Leu Phe Ala Trp Arg Gly Tyr Val Ala Lys Ala Ser
 305 310 315 320

gcc aat att gcc gtc aga aca ctg tta act ctt gga ggc aat tcg atc 1008
 Ala Asn Ile Ala Val Arg Thr Leu Leu Thr Leu Gly Gly Asn Ser Ile
 325 330 335

ttt aaa ggc gat ccg gta gaa ctg ttc aca aga gat ttg cta gcg gtg 1056
 Phe Lys Gly Asp Pro Val Glu Leu Phe Thr Arg Asp Leu Leu Ala Val
 340 345 350

gcc gca cat cct aac tcc ctg tgg gag gat gcg atg gct gca tat gga 1104
 Ala Ala His Pro Asn Ser Leu Trp Glu Asp Ala Met Ala Ala Tyr Gly
 355 360 365

aga acg ata ttc ggg ctg cca ggg gac cca gtc tgg taa 1143
 Arg Thr Ile Phe Gly Leu Pro Gly Asp Pro Val Trp
 370 375 380

<210> 34
 <211> 380
 <212> PRT
 <213> Bacillus stearothermophilus

<400> 34

Met Glu Lys Asn Lys Met Leu Ile Glu Glu Lys Leu Asp Thr Ala Ala
 1 5 10 15

Leu Leu Ala Lys Ala Glu Glu Ile Gly Arg Ile Ala Glu Glu Glu Ala
 20 25 30

Gly Glu Ala Asp Arg Asn Ala Cys Phe Ser Asp Arg Val Ala Arg Ala
 35 40 45

Ile Lys Glu Ala Gly Phe His Lys Leu Met Arg Pro Lys Gln Tyr Gly
 50 55 60

Gly Leu Gln Val Asp Leu Arg Thr Tyr Gly Glu Ile Val Arg Thr Val
 65 70 75 80

Ala Arg Tyr Ser Val Ala Ala Gly Trp Leu Thr Tyr Phe Tyr Ser Met
 85 90 95

His Glu Val Trp Ala Ala Tyr Leu Pro Pro Lys Gly Arg Glu Glu Ile
 100 105 110

Phe Gly Gln Gly Gly Leu Leu Ala Asp Val Val Ala Pro Val Gly Arg
 115 120 125

Val Glu Lys Asp Gly Asp Gly Tyr Arg Leu Tyr Gly Gln Trp Asn Phe
 130 135 140

Cys Ser Gly Val Leu His Ser Asp Trp Ile Gly Leu Gly Ala Met Met
 145 150 155 160

Glu Leu Pro Asp Gly Asn Ser Pro Glu Tyr Cys Leu Leu Val Leu Pro
 165 170 175

Lys Ser Asp Val Gln Ile Val Glu Asn Trp Asp Thr Met Gly Leu Arg
 180 185 190

Ala Ser Gly Ser Asn Gly Val Leu Val Glu Gly Ala Tyr Val Pro Leu
 195 200 205

His Arg Ile Phe Pro Ala Gly Arg Val Met Ala His Pro Leu Phe Leu
 210 215 220

Leu Gly Phe Pro Leu Val Ser Leu Gly Gly Asp Glu Arg Leu Val Ser
 225 230 235 240

Leu Phe Gln Glu Arg Thr Glu Lys Arg Ile Arg Val Phe Lys Gly Gly
 245 250 255

Ala Lys Glu Lys Asp Ser Ala Ala Ser Gln Arg Leu Leu Ala Glu Met
 260 265 270

Lys Thr Glu Leu Asn Ala Met Glu Gly Ile Val Glu Gln Tyr Ile Arg
 275 280 285

Gln Leu Glu Ala Cys Gln Lys Glu Gly Lys Thr Val Met Asn Asp Met
 290 295 300

Glu Arg Glu Gln Leu Phe Ala Trp Arg Gly Tyr Val Ala Lys Ala Ser
 305 310 315 320

Ala Asn Ile Ala Val Arg Thr Leu Leu Thr Leu Gly Gly Asn Ser Ile
 325 330 335

Phe Lys Gly Asp Pro Val Glu Leu Phe Thr Arg Asp Leu Leu Ala Val
 340 345 350

Ala Ala His Pro Asn Ser Leu Trp Glu Asp Ala Met Ala Ala Tyr Gly
 355 360 365

Arg Thr Ile Phe Gly Leu Pro Gly Asp Pro Val Trp
 370 375 380

<210> 35
 <211> 1191
 <212> DNA
 <213> Helianthus annuus

<220>
 <221> CDS
 <222> (1)..(1191)

<400> 35
 atg gcg att cgc atc aat acg gcg acg ttt caa tca gac ctg tac cgt 48
 Met Ala Ile Arg Ile Asn Thr Ala Thr Phe Gln Ser Asp Leu Tyr Arg
 1 5 10 15

tca ttc gcg ttt cct caa ccg aaa cct ctc aga tct ccc aaa ttc gcc 96
 Ser Phe Ala Phe Pro Gln Pro Lys Pro Leu Arg Ser Pro Lys Phe Ala
 20 25 30

atg gct tcc acc att gga tcc gct aca acg aag gtt gaa agc acc aaa 144
 Met Ala Ser Thr Ile Gly Ser Ala Thr Thr Lys Val Glu Ser Thr Lys
 35 40 45

aag ccc ttt acc cct cca agg gag gtt cac caa cag gtg cta cac tca 192
 Lys Pro Phe Thr Pro Pro Arg Glu Val His Gln Gln Val Leu His Ser
 50 55 60

atg ccg cca caa aag atc gaa atc ttc aaa tcc atg gag ggt tgg gcc 240
 Met Pro Pro Gln Lys Ile Glu Ile Phe Lys Ser Met Glu Gly Trp Ala
 65 70 75 80

gaa aat aac ata ttg gtt cac cta aag cct gtc gaa aaa tgc tgg caa 288
 Glu Asn Asn Ile Leu Val His Leu Lys Pro Val Glu Lys Cys Trp Gln
 85 90 95

gca cag gat ttc cta cca gat ccc gca tct gac gga ttt atg gaa caa 336
 Ala Gln Asp Phe Leu Pro Asp Pro Ala Ser Asp Gly Phe Met Glu Gln
 100 105 110

gtg gag gaa tta cgg gct cgg gct aag gag att ccg gat gat tac ttt Val Glu Glu Leu Arg Ala Arg Ala Lys Glu Ile Pro Asp Asp Tyr Phe 115 120 125	384
gtt gtt ttg gtt gga gat atg att act gaa gaa gca ctg cct act tac Val Val Leu Val Gly Asp Met Ile Thr Glu Glu Ala Leu Pro Thr Tyr 130 135 140	432
caa aca atg ctt aat act ctt gat ggt gtg cgt gat gag acc ggg gct Gln Thr Met Leu Asn Thr Leu Asp Gly Val Arg Asp Glu Thr Gly Ala 145 150 155 160	480
acc cta ctt ctt ggg cta gtc tgg act cgg gct tgg acc gct gaa gaa Thr Leu Leu Leu Gly Leu Val Trp Thr Arg Ala Trp Thr Ala Glu Glu 165 170 175	528
aac agg cac ggt gat ctt cta cat cag tat ctg tat ctt agt ggg cgg Asn Arg His Gly Asp Leu Leu His Gln Tyr Leu Tyr Leu Ser Gly Arg 180 185 190	576
gtc gac atg agg cag att cag aag aca att cag tac ctc att ggg tct Val Asp Met Arg Gln Ile Gln Lys Thr Ile Gln Tyr Leu Ile Gly Ser 195 200 205	624
gga atg gac ccc cgg acc gaa aac agt cct tac ctt ggg ttc atc tac Gly Met Asp Pro Arg Thr Glu Asn Ser Pro Tyr Leu Gly Phe Ile Tyr 210 215 220	672
act tca ttt caa gag cgt gcc acc ttc atc tct cac gga aac aca gcc Thr Ser Phe Gln Glu Arg Ala Thr Phe Ile Ser His Gly Asn Thr Ala 225 230 235 240	720
cgg cac gca aag gag cat ggt gac gtg aag ctg gct caa atg tgc ggt Arg His Ala Lys Glu His Gly Asp Val Lys Leu Ala Gln Met Cys Gly 245 250 255	768
ata att gca gct gat gaa aaa agg cac gaa acc gcc tac aca aaa ata Ile Ile Ala Ala Asp Glu Lys Arg His Glu Thr Ala Tyr Thr Lys Ile 260 265 270	816
gta gaa aaa ctc ttc gaa att gac ccg gac ggc act gtt ctc gct ttt Val Glu Lys Leu Phe Glu Ile Asp Pro Asp Gly Thr Val Leu Ala Phe 275 280 285	864
gcc gac atg atg agg aaa aag atc tcc atg cct gca cac ttg atg tac Ala Asp Met Met Arg Lys Lys Ile Ser Met Pro Ala His Leu Met Tyr 290 295 300	912
gat ggg cgt gat gat aac ctc ttc gaa aat ttc tca gct gtt gcc caa Asp Gly Arg Asp Asp Asn Leu Phe Glu Asn Phe Ser Ala Val Ala Gln 305 310 315 320	960
agg ctc ggt gtg tac act gcg aag gac tat gca gac att ctg gag ttt Arg Leu Gly Val Tyr Thr Ala Lys Asp Tyr Ala Asp Ile Leu Glu Phe 325 330 335	1008
ctg gtg ggc cgg tgg aag gtg gcg gat tta acc ggg ctt tct ggt gaa Leu Val Gly Arg Trp Lys Val Ala Asp Leu Thr Gly Leu Ser Gly Glu 340 345 350	1056
ggg cgt aaa gcc caa gac tat gtg tgc ggg ctg gcc cca aga atc aga Gly Arg Lys Ala Gln Asp Tyr Val Cys Gly Leu Ala Pro Arg Ile Arg 355 360 365	1104
agg ctt gag gag agg aac tcg gca agg gcg aag gaa agt gtg aac gtt Arg Leu Glu Glu Arg Asn Ser Ala Arg Ala Lys Glu Ser Val Asn Val 370 375 380	1152
ccg ttc agc tgg atc ttt gat aga gaa gtg aag ctc tga Pro Phe Ser Trp Ile Phe Asp Arg Glu Val Lys Leu 385 390 395	1191

<210> 36

<211> 396

<212> PRT

<213> Helianthus annuus

<400> 36

Met Ala Ile Arg Ile Asn Thr Ala Thr Phe Gln Ser Asp Leu Tyr Arg
 1 5 10 15
 Ser Phe Ala Phe Pro Gln Pro Lys Pro Leu Arg Ser Pro Lys Phe Ala
 20 25 30
 Met Ala Ser Thr Ile Gly Ser Ala Thr Thr Lys Val Glu Ser Thr Lys
 35 40 45
 Lys Pro Phe Thr Pro Pro Arg Glu Val His Gln Gln Val Leu His Ser
 50 55 60
 Met Pro Pro Gln Lys Ile Glu Ile Phe Lys Ser Met Glu Gly Trp Ala
 65 70 75 80
 Glu Asn Asn Ile Leu Val His Leu Lys Pro Val Glu Lys Cys Trp Gln
 85 90 95
 Ala Gln Asp Phe Leu Pro Asp Pro Ala Ser Asp Gly Phe Met Glu Gln
 100 105 110
 Val Glu Glu Leu Arg Ala Arg Ala Lys Glu Ile Pro Asp Asp Tyr Phe
 115 120 125
 Val Val Leu Val Gly Asp Met Ile Thr Glu Glu Ala Leu Pro Thr Tyr
 130 135 140
 Gln Thr Met Leu Asn Thr Leu Asp Gly Val Arg Asp Glu Thr Gly Ala
 145 150 155 160
 Thr Leu Leu Leu Gly Leu Val Trp Thr Arg Ala Trp Thr Ala Glu Glu
 165 170 175
 Asn Arg His Gly Asp Leu Leu His Gln Tyr Leu Tyr Leu Ser Gly Arg
 180 185 190
 Val Asp Met Arg Gln Ile Gln Lys Thr Ile Gln Tyr Leu Ile Gly Ser
 195 200 205
 Gly Met Asp Pro Arg Thr Glu Asn Ser Pro Tyr Leu Gly Phe Ile Tyr
 210 215 220
 Thr Ser Phe Gln Glu Arg Ala Thr Phe Ile Ser His Gly Asn Thr Ala
 225 230 235 240
 Arg His Ala Lys Glu His Gly Asp Val Lys Leu Ala Gln Met Cys Gly
 245 250 255
 Ile Ile Ala Ala Asp Glu Lys Arg His Glu Thr Ala Tyr Thr Lys Ile
 260 265 270
 Val Glu Lys Leu Phe Glu Ile Asp Pro Asp Gly Thr Val Leu Ala Phe
 275 280 285
 Ala Asp Met Met Arg Lys Lys Ile Ser Met Pro Ala His Leu Met Tyr
 290 295 300
 Asp Gly Arg Asp Asp Asn Leu Phe Glu Asn Phe Ser Ala Val Ala Gln
 305 310 315 320
 Arg Leu Gly Val Tyr Thr Ala Lys Asp Tyr Ala Asp Ile Leu Glu Phe
 325 330 335
 Leu Val Gly Arg Trp Lys Val Ala Asp Leu Thr Gly Leu Ser Gly Glu
 340 345 350
 Gly Arg Lys Ala Gln Asp Tyr Val Cys Gly Leu Ala Pro Arg Ile Arg
 355 360 365
 Arg Leu Glu Glu Arg Asn Ser Ala Arg Ala Lys Glu Ser Val Asn Val
 370 375 380
 Pro Phe Ser Trp Ile Phe Asp Arg Glu Val Lys Leu

385

390

395